Letter from the publisher: The sexy touch screen…by Mark Fihn

News from around the world

DisplaySearch US FPD Conference, March 2-4, 2009, La Jolla, California
Phillip Hill covers presentations from DisplaySearch, Elo TouchSystems, and Synaptics

Virtual Reality Software and Technology Conference, October 27-29, 2008, Bordeaux, France
Phillip Hill covers this VRST symposium organized by ACM with presentations from McGill University/Grenoble University, University of South Australia, Immersion SAS, Vienna University of Technology, Haption/ENS Cachan, Bauhaus-Universität/Osaka University, Centre Européen de Réalité Virtuelle, Fraunhofer Institut für Graphische Datenverarbeitung, Vienna University of Technology, and Ryukoku University/Chukyo TV Broadcasting

Interface Software and Technology (UIST), October 19-22, 2008, Monterey, California
Phillip Hill reports on this conference with presentations from University Paris-Sud, University of Waterloo/University of North Carolina at Charlotte, Newcastle University, Stanford University, University of California/Microsoft Research, and University of Michigan

Phillip Hill covers the touch aspects of this conference with presentations from Toshiba America Electronic Components, Elo TouchSystems, Stantum, and RPO

Interview with Garrick Infanger from VISSUMO

Windows 7 touch implementation by Dave Bhattacharjee

Learning through touch: the story behind the SMART Table by Heather Ellwood

Storytelling memories: a tangible connection to Bomber Command veterans by Tanya Marriott

Last Word: The touch gaming phenomenon by Bob Senior

Display Industry Calendar

The Touch Panel is focused on bringing news and commentary about the activities of the companies and technologies related to touch screens and related technologies for the displays industry. The Touch Panel is published electronically 10 times annually by Veritas et Visus, 3305 Chelsea Place, Temple, Texas, USA, 76502. Phone: +1 254 791 0603. http://www.veritasetvisus.com

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Subscription rate: US$47.99 annually. Single issues are available for US$7.99 each. Hard copy subscriptions are available upon request, at a rate to be determined based on location and mailing method. Copyright 2009 by Veritas et Visus. All rights reserved. Veritas et Visus disclaims any proprietary interest in the marks or names of others.
The sexy touch screen...

by Mark Fihn

When I started this newsletter, I was quite worried as to how I’d make the newsletter visually stimulating. I was confident that there was considerable interest in the topic of touch-screen technologies and applications, but there are just so many ways in which a resistive overlay can be shown… The other day I came across an advertisement for some projected capacitive products recently introduced by EZScreen, which fully makes my point.

“Our ThruTouch touch screen is a flexible polycarbonate sheet. It contains a nearly invisible grid that projects a very low amperage capacitance field through almost any non-metallic material.

Don’t limit your imagination to flat surfaces or standard sizes. We can accommodate curved surfaces and custom screens to suit your specific requirements”.

http://www.ezscreen.com

While attractive women are used to promote most everything imaginable, it’s perhaps a bit obvious to flail skin in a promotion for a “flexible polycarbonate sheet”.

Indeed, when I initially tell people about the Touch Panel newsletter, the typical first reaction is to wonder if there’s really any interest in the topic, but as I warm to the discussion, it quickly becomes quite easy to discuss touch technologies in a way that creates a bit of excitement.

Long time readers of the Touch Panel will be fully aware of just how stunning the imagery can be in relation to touch technologies, applications, artistic endeavors, and some of the truly sensational innovation that is going on around the world. Arguably, the combination of our visual and tactile senses evokes some intriguing development work that enjoys increasing popularity in the worlds of art, architecture, computing, entertainment, as well as numerous practical applications where a traditional keyboard and mouse just are not sensible.

During the third week in April, Intertech/PIRA is putting on their first “Interactive Displays” event in San Jose – promising to be a real showcase event (http://www.int-displays.com). I’m honored to be speaking at the event, under the topic of “Touch in a Touchless World” where I’m looking forward to exploring some of the insights I’ve gained while publishing two of the Veritas et Visus newsletters – the Touch Panel and the 3rd Dimension. Although my talk is unlikely to include lurid photos of attractive female models, the topic is almost certain to get the hearts of most attendees pumping, at least a little bit. Hope to see you there!
**News from around the world**

Compiled by Phillip Hill and Mark Fihn

**Anoto Digital Pen technology brings PolyVision next-generation interactive whiteboard to life**

Anoto, the inventor of Digital Pen and Paper technology (DP&P), is providing the technology behind PolyVision’s new ėno interactive whiteboard. ėno combines the simplicity of a traditional whiteboard surface with interactive functionality, without cables or costly installation. The Anoto Bluetooth-enabled digital pen, an ėno interactive whiteboard and a simple projector allow teachers to transition from ink to Internet, from markers to multimedia in an instant without a need for wired connections to power or data. Anoto technology uses a patent-protected dot pattern that is integrated into PolyVision’s e3 environmental “ceramicsteel” surface to create the ėno board. The pattern, which is nearly invisible to the naked eye, can be read by a digital pen, which records and interprets hand-written strokes. Written data can be stored and uploaded for effortless memory capture. This is the first product launched by Anoto and PolyVision following the announcement of their partnership back in April 2008. [http://www.polyvision.com](http://www.polyvision.com)

**Luidia previews future eBeam products**

Luidia, a provider of interactive whiteboard technology and manufacturer of the eBeam interactive systems for classrooms and conference rooms, previewed a collection of new products to enhance its eBeam systems. Attendees at TCEA had a sneak peak at Luidia’s new document camera, the eBeam Focus 150, which brings real world content into an eBeam interactive digital whiteboard environment with a single click of the mouse or stylus. Users will be able to take snapshots of text, physical objects, or even people and have them appear instantly in eBeam Scrapbook. Additionally, video recordings can be captured and saved in the Adobe Flash video file format, then added to the Scrapbook file. Luidia also previewed its eBeam Inscribe 200e, a wireless writing tablet designed specifically for the education market. With the new eBeam Inscribe, teachers are free to perform familiar mouse functions from anywhere in the room. This releases an educator from his or her computer or whiteboard, allowing unencumbered movement and the ability to engage with students individually while maintaining command of the interactive lesson. The tablets are lightweight and compact and have seamless integration with eBeam Scrapbook. TCEA attendees also got a first look at the new eBeam LiveWire, a USB plug-in device that contains built-in eBeam software so that users can operate eBeam hardware without having to download or install additional software. This new product virtually eliminates the need for administrator access on PCs when using eBeam systems in higher security environments. [http://www.luidia.com](http://www.luidia.com)

**Luidia introduces eBeam workgroup toolkit**

Luidia, a global provider of interactive whiteboard technology and manufacturer of the eBeam interactive systems for classrooms and conference rooms, announced the debut of their new eBeam Workgroup Toolkit, a collection of their intuitive software and hardware designed specifically to enhance the business operations of any corporate workgroup. The first in a planned series of products designed to improve business productivity in a challenging economic climate, the eBeam Workgroup Toolkit will allow geographically-dispersed teams to collaborate more efficiently and cost-effectively. Immediate capture and participation in a real-time eBeam virtual meeting means that all participants can be 100% involved, allowing the group to fully mine their creative potential without the costs of business travel. The corporate bundle will also provide an extra interactive stylus and the eBeam Interact software, which includes MyScript, eBeam’s new handwriting recognition software from Vision Objects. In addition, users will receive an eBeam meeting license for up to 10 users for one year. [http://www.luidia.com](http://www.luidia.com)
SMART releases software development kit for SMART Table

SMART Technologies announced that a software development kit (SDK) for the SMART Table interactive learning center is now available through the SMART Development Network. The SMART Table is a ground-breaking interactive display designed specifically for pre-K-3 students (ages 4-8). To encourage the rapid development of education content for this new product category and to invite developers to participate in the evolution of an exciting new medium, the SDK will be made available to those interested in creating multi-user, multi-touch table applications. The SDK supports development in C++, C#, VB and Java languages, and includes source code for multi-touch interface elements such as photographs and text regions. The SMART Table was announced in October 2008 as the first multi-user, multi-touch table for primary school children. It provides a learner-centric experience that allows small groups of students to use the table’s interactive surface to select or move objects, draw or write on the screen simultaneously and work together to find answers to preset questions. The SDK includes a comprehensive manual that outlines usability guidelines, application packaging, application types and additional useful information. SMART will also host a website to showcase some of the best applications created by third-party developers for the table. The website will provide visibility for developers creating applications for the table and easy access for educators looking for table content. The SDK is available now at no cost for noncommercial development. Developers interested in developing applications for the SMART Table should visit sdn.smarttech.com.

PLUS Vision renews its copyboard products

PLUS Vision Corp. has renewed its Copyboard and Captureboard product line. The update consists of three Copyboard models and two Captureboard models. These products were introduced in January 2009. The updates include the enhancement of security features and improved PC connectivity as well as improvements made to the Capture function (Captureboard). The new M-12 and C-12 Series maintain the core features of their predecessors, the M-11 and C-11. The M-12 Series Copyboards allow for the information written on the board to be either printed or saved as digital files, either to a USB memory stick or directly to a PC. The C-12 Series Captureboards let the user annotate images projected on the screen with hand-written notes and drawings, and then save both the projected image and the hand-written notes as a single digital file. In developing the new 12 Series, PLUS has focused on improvements to the user interface as well as requests for security features. http://www.plus-vision.com

Oberthur Technologies announces the first motion detection SIM card

Oberthur Technologies announced SIMSense – the first motion detection and handset-independent SIM card. This patent-pending technological breakthrough SIM card brings new opportunities for mobile network operators and convenience. The possible applications of SIMSense are based on incorporating accelerometers and temperature captors that enable motion detection. SIMSense allows mobile network operators to offer services which not only facilitate but improve in managing people’s daily lives, for example in the following situations: busy call – simply by shaking or tapping the handset the busy recipient of the call can send a predetermined text message to the caller informing that they are busy and will call back later; menu selection – the user can locate the menu of services and applications just by shaking or tapping the handset; body fall – in an emergency (such as a person falling down) if the handset is close to the human body, the smart application is able to send a predetermined text message to a predetermined point of contact, such as relatives or dial for an ambulance. http://www.oberthurcs.com
Canesta granted patent for touchless gesture recognition

Electronic perception technology pioneer Canesta, inventor of a family of low-cost, chip-based 3D sensors, received their 37th granted US patent in late December 2008, following four others that issued in the last quarter of 2008 alone, and 12 for the year. 3D sensors are emerging as a key enabling technology for advanced automotive safety – such as back-up warnings or seat occupant characterization – and more recently for touchless gesture recognition. True 3D sensing involves determining the distance from the sensor to every important feature in the sensor’s field of view, and then using that information to discriminate objects, individuals, movements, body parts, hand gestures, or just about any other feature – mimicking the process performed so effortlessly by human eyes and brains. When performed electronically, however, it gives ordinary devices an entirely new degree of perception that enables unprecedented interaction with the surrounding environment. The core technology, called “time of flight”, relates to the RADAR-like aspect of the tiny CMOS sensor chips. Individual distances to features in a scene are actually determined by the sensor calculating the time it takes a photon of infrared light to travel to that feature and back. Canesta’s sensors do this in real time, for thousands of details, at rates up to 60 frames per second. That time-of-flight technology, covered by 17 granted US patents and at least four more pending, is particularly rich and robust. For example, Canesta’s 3D sensors can operate in all lighting conditions, including bright sunlight, and are not fooled by lack of contrast, or by background features that mimic features of interest. No other 3D sensor, true or simulated – for example, two-camera solutions – can claim this level of performance at commercially-useful resolutions. http://www.canesta.com/products-andtechnology/products/patents

Oxford University Press publishes book on human hand function

“Human Hand Function” is a multidisciplinary book that reviews the sensory and motor aspects of normal hand function from both neurophysiological and behavioral perspectives. Lynette Jones and Susan Lederman present hand function as a continuum ranging from activities that are essentially sensory in nature to those that have a strong motor component. They delineate four categories of function along this sensorimotor continuum – tactile sensing, active haptic sensing, prehension, and non-prehensile skilled movements – that they use as a framework for analyzing and synthesizing the results from a broad range of studies that have contributed to our understanding of how the normal human hand functions. The book begins with a historical overview of research on the hand and a discussion of the hand’s evolutionary development in terms of anatomical structure. The subsequent chapters review the research in each of the four categories along the continuum, covering topics such as the intensive spatial, temporal, and thermal sensitivity of the hand, the role of hand movements in recognizing common objects, the control of reaching and grasping movements, and the organization of keyboard skills. Jones and Lederman also examine how sensory and motor function develops in the hand from birth to old age, and how the nature of the end effector (e.g., a single finger or the whole hand) that is used to interact with the environment influences the types of information obtained and the tasks performed. The book closes with an assessment of how basic research on the hand has contributed to an array of more applied domains, including communication systems for the blind, haptic interfaces used in teleoperation and virtual-environment applications, tests used to assess hand impairments, and haptic exploration in art. Human Hand Function is likely to help researchers in neuroscience, cognitive psychology, engineering, human-technology interaction, and physiology. http://www.oup.com
WHITEvoid designs Polygon Playground interactive art installation

Polygon Playground is an interactive art installation in which graphics are projected onto a multifaceted sculpture. The projection surface is the base of a large lounge object that offers room for up to 40 persons at a time. A 3D surface projection system displays graphics on the structure, using 360 degree mapping, while a sensory system detects the position and proximity of visitors. The presence and movement of people dynamically transform the visual moods and graphic appearance. Polygon Playground is designed by WHITEvoid and was on display at the Skanderborg Music Festival in Denmark, 2008. [http://www.whitevoid.com](http://www.whitevoid.com)

Capella Garcia Arquitectura introduces “Heaven”

Heaven, by Capella Garcia Arquitectura, is an ephemeral space created to show off the virtues of a constructional system using a plastic material which was developed by the Resyrok Company. This display can be found in Barcelona’s Casa Decor Fair as part of the “Pathway to a sustainable environment” exhibit. “Heaven” invites the visitor to travel along a tunnel revealing the material’s varied possibilities. There are two openings in the facade: one of them, which comes forward to receive you, is the entrance, and the other, which seems to retreat from you, is the exit. The interior lighting keeps changing color and shade, making the plastic membrane into something living. As you enter you go through a large dome where an oscillating lamp hangs like a tonsil. In one place, the glossy-finish plastic material looks like a painted wall and reflects the light; in another, the same material, but this time with a translucent finish and illuminated from behind, turns the walls into a great lamp that keeps taking on different colors, through a system of electronically-programmed LEDs (RGB). When you reach the end, the black walls make the space disappear, and in the darkness the moving image of a fire emerges and vanishes behind the micro-perforated surface of the material, deceiving the eye and producing a hyper-realistic effect. Opposite the image, in the central zone, one whole wall is filled with a projected video of the seabed in constant motion, giving the sensation of being submerged under water. Continuing towards the exit you come to an oval window where the material becomes semitransparent, and through it can be seen a curtain of autumn leaves in silhouette, in constant movement thanks to a fan. [http://www.capellaweb.com/website/index.html](http://www.capellaweb.com/website/index.html)
Interactive game brings 1000-year-old runes to life

Using advanced projection techniques, a 1000-year-old runic stone at the cultural history museum in Randers, Denmark, is brought to life. The story written in the runes is told, using a combination of animations, surround sound, and an interactive game that tempts the spectator to play with the runes. Once a spectator approaches the stone, it immediately lights up and becomes a canvas for the narration. The first part of the sequence is an animation telling the dramatic story of Eskil and Thore, who drowned during a violent storm. The second part simulates the runes being carved by Eskil’s father, Åne, followed by a sequence of various effects that illustrate the passage of time and the different seasons. Eventually, the stone cracks and reveals the runes in flames. As the flames die out, all the words slide from their places and onto the floor before the stone. The spectator can interact with the runes, and eventually kick them back to their starting points. http://www.khm.dk/

As the flames die out, all the words slide from their places and onto the floor before the stone. The spectator can interact with the runes, and eventually kick them back to their starting points.

Once all the runes are back in place, the words will transform into a Danish translation.

Sungheng develops musical instrument with tangible interface

Doubles is an electronic musical instrument with a tangible user interface. Using two physical objects on a table, several performers can simultaneously interact with the instrument, which registers speed, distance, and motion of the objects. The surface of the table is paved with beads, which roll when the physical objects on them are moved. This creates a sliding effect of acceleration, and a centrifugal force is created, to compute the audio and visuals in the installation. http://www.youtube.com/watch?v=GeHkyjoKj9U
Abundance transforms San Jose plaza
Abundance has transformed the City Hall plaza of San Jose, California, into an interactive social space. At night, a dynamic animation based on the movements of people is projected onto the three-story, cylindrical rotunda. A video camera mounted on the City Hall registers the presence of visitors. Different colored patterns are projected onto the building, based on varied factors, such as location of the people, and whether they’re moving alone or in groups. Individuals erase the background color, while groups fill it back in. In certain places, people’s positions launch moon-shaped graphics that travel in a trajectory opposite the person’s path. If another person moves across the “moon”, it disintegrates and releases a colored burst, to further add to the projection’s colorful appearance. Abundance was created by Camille Utterback in 2007. http://www.camilleutterback.com/abundance.html

Aeolab and Frog Design create MiraxCity
MiraxCity is an interactive installation created in collaboration with Frog Design for the reception lobby of Moscow-based real estate developer Mirax Group. Aeolab designed and implemented a custom software program that processes real-time input from a video camera to create an ever-shifting landscape of abstracted urban forms. As visitors move through the lobby, their paths are mapped onto a three-dimensional virtual space populated by “buildings” generated from the outlines of the Moscow city plan. Real world activity causes the virtual city to grow, then slowly decay with time while the city view subtly shifts from one point to another. Technologies used are OpenGL/C++ and 100-inch plasma displays. http://www.aeolab.com
Aeolab develops handheld device for learning applications

OUiP! is a hand-held device designed with children and adults in mind, developed for the industrial design and ideation company. The primary mode of interaction with the device is through motion, by way of tilting, turning and shaking. OUiP! also responds to sound input via a built-in microphone. Several interactive graphical programs were designed to showcase its features and encourage learning and exercise activities. This project is created from ground up around the open-source Linux platform. OUiP! is a little computer based on EM-X270 embedded mobile device board by Compulab, interfaced to custom electronics with accelerometer and microcontroller circuits. Software programs were written in C utilizing the Cairo graphics library. http://www.aeolab.com

Lab Au shows off “Binary Waves” kinetic light sculpture

Binary Waves is an urban and cybernetic installation developed by Lab Au and is based on the measuring of flows and their transposition into luminous, sonic and kinetic rules. This relation between the installation and the urban activity happens in real time and sets each person as an element of the installation, as a center of the public realm. The installation is constituted by a network of rotating and luminous panels of 3 meter-high and 60 centimeter wide, forming a kinetic wall. The panels rotate around their vertical axis, and have a black reflective surface on one side, the other being plain mat white. Their rotation is controlled by microprocessors, allowing to determine precisely the rotation speed and angle, while their networking allows to synchronize the movement of the panels. The microprocessors are connected to infrared sensors, capturing the movement of passer-by’s, defining the frequency and amplitude of the rotation. According to this set up, each impulse is transmitted from one panel to the other, describing visual waves running from one side of the installation to the other, and then bouncing back while progressively loosing oscillation. The kinetic principle driving the installation is derived from wave propagation in water, which, because of the canal, is one of the project’s contextual parameters. http://www.lab-au.com

Light reinforces the kinetic principle of the panels. The kinetic and illumination vocabulary is based on the parameter of time (duration = repercussion of a signal over the panels), speed (force of impulse) and the sense of rotation.
Leo Villareal creates light experience for the National Gallery of Art

Situated at a 200-foot-long tunnel in the National Gallery of Art in Washington DC, Multiverse encloses visitors in 41,000 LED nodes that flicker in rhythmic patterns. As visitors travel between the gallery’s two main buildings on a moving walkway, they experience a new installation by American artist, Leo Villareal. The ceiling and one of the walls are covered in computer-controlled LEDs that light up in predetermined patterns, but with a random function built in, to ensure that no one will see the same configuration twice. Multiverse can be experienced throughout 2009. [http://www.villareal.net/project_1.html](http://www.villareal.net/project_1.html)

PenMount USB controller supports Windows 7 gestures

The Microsoft Windows 7 operating system provides several kinds of touch input gestures to improve user experience. PenMount touch controllers will be compatible with the gesture support in Windows 7. The gesture support is not a totally new feature in Microsoft Windows 7 operating system. Microsoft started gesture recognition in Microsoft Windows XP Tablet PC Edition. Gesture occurs when operating mouse or touch screen devices with predefined patterns in certain areas and at a certain period of time. By this specific tracking line, we then make the definition of a feature in system or application software, it is called “gesture” operation. For example, Microsoft Windows 7 and Vista operating system includes a “Flicks” function, which has defined several gestures in the pen input device; it provides more convenience and is more user friendly in the applications; user can scroll up and down for “page up and down” function. Besides the 4 to 8 types of Flicks options in Windows Vista, it is also available for user to pick up more predefined function code from the hotkey menu. If a user wants to use “flicks” and relative API with PenMount touch controller, you they need to install the PenMount pen input device driver instead of the standard PenMount Universal Driver. [http://www.penmount.com](http://www.penmount.com)
Rafael Lozano-Hemmer creates “Pulse Room” exhibit

Pulse Room consists of a large number of light bulbs distributed over an exhibition room. The light bulbs are connected to an interface that senses the heart rate of participants. When a visitor touches the interface, it detects the pulse and triggers the closest bulb to flash at the exact same rhythm. When the interface is released, the flashing moves on to the next bulb in the grid. Each time the interface is touched, a heartbeat is recorded and transmitted to the first bulb, causing previous patterns to be pushed further ahead in the grid. “This work was inspired by Macario, directed by Roberto Gavaldón in 1960, a film where the protagonist suffers a hunger-induced hallucination in which every person is represented by a lit candle in a cave,” said its creator Rafael Lozano-Hemmer. The installation was created in 2006, and has been on display on several occasions. Currently it can be experienced at the ARoS art museum, in Aarhus, Denmark. http://www.lozano-hemmer.com

Blendid Interactive Design develops mixed reality sculpture

Swarm from Blendid Interactive Design is a mixed reality sculpture. It intersects a static physical swarm of light objects and a virtual swarm of moving colors that reacts to those walking underneath. Its appearance invokes associations with flocks, schools and swarms, where many individuals seem to merge into a single super-organism with its own distinct character. Swarm is one of eight interactive works selected for Re-ACT/Interactive Light Art – an exposition of art installations and objects, all with some form of built in interaction. In this case the position of people under the installation is used to attract a swarm of colored light that travels through the sculpture. When no-one is engaged in direct playful interaction with the piece, it will start displaying its own decorative behavior. For the design of Swarm the company made use of Blender and some custom built tools to generate the six meter wide swarm-like shape consisting of almost 500 elements. The control software was created in openFrameworks and uses flocking algorithms and computer vision to let the audience influence the light animations that fly through the sculpture. Re-ACT was open to the public from 27 September 2008 until 25 of January 2009 at the Centre for Artificial Light in Art (Centrum Kunstlicht in de Kunst) in Eindhoven, the Netherlands. http://www.blendid.nl

Immersion drives development of haptic-enabled integrated circuits

Immersion Corporation announced a licensing and development agreement with Imagis Co., Ltd. of South Korea, a leading developer and manufacturer of integrated circuits (IC). Imagis will incorporate Immersion’s programmable high-fidelity haptic technology in chips designed for electronic devices, making it faster, easier, and cheaper for manufacturers to integrate haptic (touch) feedback into products such as consumer electronics, mobile phones, and handheld devices for commercial and industrial applications. http://www.immersion.com
Ambient Space Design introduces interactive animated light wallpaper
Sara Burns from London-based Ambient Space Design is developing animated light wallpaper for domestic and public space. She can arrange to design, install, program and continually maintain the technical side of and such project. [http://www.ambientspacedesign.com](http://www.ambientspacedesign.com)
Big Shadow creates giant shadows on buildings

Big Shadow is an interactive installation in which magnified shadows of people are projected onto a building, seven stories high. The shadows can suddenly change into the shape of a dragon, resembling the “Blue Dragon” from the Xbox 360 game of the same name. The shadows are projected images of real people captured by a video camera. The shadows can change shape based on particular gestures performed by people such as raising their arms, which will morph the shadow into a dragon. Sometimes the shadows of a large foot or a hand spilling a cup of water will also interact with people’s shadows. Via a dedicated website, another person’s shadow can be added to the projection, using a webcam. http://bigshadow.jp/judge/

Sensacell develops interactive floor

A large interactive LED floor was on display at the 2008 World Expo in Spain. The floor was based on Sensacell. The Sensacell system is a module-based sensor system that can be assembled to form interactive surfaces of almost any size or shape. It consists of independent 6x6 inch modules, each containing sensors, networking technology, and LED lighting. The sensors can detect people and objects up to 6 inches away and light up accordingly, even through materials such as glass, rubber, and wood. When multiple modules are connected, they generate a network in which they are able to communicate with each other. This means that visual data can “flow” from one module to its neighbor. Apart from the intercommunication, any module in the grid can be accessed by an external computer that can read its state and control its behavior. The modules can be equipped with LEDs of different colors and sizes. http://www.sensacell.com
Multi-touch Air Hockey game on show in Amsterdam

Using a 103-inch Panasonic plasma display with a touch overlay, an expensive, digital version of the classic Air Hockey game was on display at ISE 2009 in Amsterdam. Multi-touch software by UI Centric was used to create a modern version of the game, which is usually based upon a cushion of air on the play surface, which reduces the friction on the game puck. The multi-touch display shows a virtual puck and virtual mallets that are controlled simply by touching the screen. It provides a glimpse of what the future of multi-touch displays might bring. [http://www.uicentric.co.uk](http://www.uicentric.co.uk)

Pixel Project creates interactive table Liliesleaf Museum

The Pixel Project has created an interactive table using wiimotes, which track two aluminum objects that are used as interaction devices. Located at the Liliesleaf Museum in Johannesburg, South Africa, the table displays a 3D interface consisting of video, images, audio, and text. The interface is browsed by visitors, using two aluminum “navigators”, which allow them to view information about the Apartheid era in South Africa. The interactive table was built using the papervision API and the Wii flash API. [http://www.pixelproject.com](http://www.pixelproject.com)

EVL develops 4-megapixel multi-touch LCD table prototype

The 4-megapixel multi-touch LCD table prototype developed by EVL (Electronic Visualization Laboratory at the University of Illinois at Chicago) researchers focuses upon seamless and intuitive user interaction with the device. The current prototype supports simultaneous multi-user interaction, whereby participants simply reach-out and touch the images being displayed with their hands. This advancement in user interaction and instrumentation development research is a natural progression from EVL’s development and deployment of the Lambda Table just under a year ago. The multi-touch LCD table prototype is the first step towards a larger system that better supports group collaboration. Also, though the prototype system only supports monoscopic information, future instrumentation research and development promises to incorporate stereoscopic imagery without the need for specialized 3D glasses. [http://www.evlweb.eecs.uic.edu](http://www.evlweb.eecs.uic.edu)
University of Illinois at Chicago develops TacTile multi-touch tabletop

TacTile is a multi-touch 52-inch LCD tabletop display design to support collaborative applications through a highly intuitive, multi-user touch interface. It was developed by the Electronic Visualization Laboratory at the University of Illinois at Chicago. Users can pan, zoom, and interact with highly detailed imagery and applications, in real-time, and with improved resolution and accuracy over displays based on video projection. TacTile targets scientific researchers who require high resolution to gain insight into complex datasets, and address a broad range of e-science application areas, as well as public institutions such as museums, where such systems can appeal to a broad range of participants. The user interface relies on touch to control application navigation. The technique used to detect the users’ fingertips is FTIR (frustrated total internal reflection), which uses infrared (IR) cameras and light refraction. Tracking the fingertips is achieved through a combination of established image processing software and EVL-developed custom software. http://www.evlweb.eecs.uic.edu

Tokyo University develops deformable workspace

Researchers at the Ishikawa Komuro Laboratory at Tokyo University have come up with the “Deformable Workspace”: a membrane between real and virtual space. They propose a variant of the multi-touch display technology that introduces an original way of manipulating three-dimensional data. They call the implemented system a deformable workspace. The drawing illustrates the metaphor of the proposed deformable workspace. The virtual object “exists” and is represented in virtual space, while the user exists in real space, but is not represented (as a whole or in part) in the virtual space. The idea is to maintain a useful and simple relationship between virtual and real space by using a unique coordinate system that is shared by both spaces. Between these spaces lies a “transparent” and tangible membrane. Users can manipulate the objects in virtual space by deforming the membrane and observing the effects on the virtual object much like a surgeon operating on a patient with gloves (see photo). By doing so, the interface can create the illusion of continuity between the user’s real space and the virtual three-dimensional space. The prototype system enables this by employing three key technologies: a tangible and deformable projection screen, a real-time three-dimensional sensing mechanism, and an algorithm for dynamic compensation for anamorphic projection. They successfully demonstrated several applications including 3D translation, 3D manipulation by two hands, and arbitrary volume slicing. http://www.k2.t.u-tokyo.ac.jp/
Silke Hilsing creates Impress interactive graphics display
Impress merges the functionality of touch-screen displays with a stretchable surface made of foam. The result is a display that allows users to manipulate visual data by applying pressure and shaping a physical object. Real-time graphics are projected onto a screen consisting of a block of foam that lies on top of several force sensors. When a user presses down on the surface the sensors determine the location of the pressure and alters the projection accordingly. Several different applications have been developed, including a system that adjusts the pitch of sounds according to the applied pressure on its visual representation. Another application lets users manipulate and sculpt a simple 3D object by varying the pressure on different parts. [http://gestaltung.fh-wuerzburg.de/blogs/es/?p=863](http://gestaltung.fh-wuerzburg.de/blogs/es/?p=863)

AMT’s develops multi-finger touch screen solution
AMT is now launching the Multi-Finger Touch Screen Total Solution, a resistive touch screen with the multi-touch function after several months’ development. This touch screen supports not just one finger touch but multi-finger touch of up to twelve fingers simultaneously on just one touch panel. AMT Multi-Finger touch screen comes with the PenMount 6250 control board and driver to provide the perfect multi-touch solution kit. This Multi-finger touch kit is perfect for the application software developers to freely implement their own software application with their user interface and touch point requirements. The Multi-Finger touch screen is designable from 3-inch to 22-inch size and is customized to customers’ specifications. The AMT multi-touch kit with its Multi-Finger Touch Screen and PenMount 6250 control board and driver allow the system designer to enable or disable any of the touch zones as needed via the software control. [http://www.amtouch.com.tw/default.asp](http://www.amtouch.com.tw/default.asp)
Adobe brings out multi-touch analysis

Inspire, a publication from the Adobe Experience Design team, has issued “Adobe and the Future of Multi-touch” with an on-line video. It comes in three sections. The first “Seeding the Creative Process” recalls, for example, the long delay between John Warnock’s paper on antialiasing and the appearance of antialiased type in Photoshop. Multi-touch is another case in point. Touch-controllable hardware isn’t new. Far from it. And multi-touch controllable hardware has been around for a few years now. Since the Intel switchover, all Mac laptops have supported some form of “multi-touch gesture”. For an application maker like Adobe, this means they don’t know what hardware standards we should use as a basis for the design of multi-touch-capable software. Yet we can’t wait to develop that software, until we know what those standards will be – because if we do, another application maker will come along and eat our lunch, the author says. Adobe is managing those risks by assembling a base of knowledge on which they can make decisions and do designs. And also, critically, they are jumping right into building prototype applications – even when this means hacking together devices to run them on, using the tech equivalents of chewing gum and bailing wire. The second section deals with “Touch and creativity: then and now, and the third with tabletop applications. http://xd.adobe.com

Tearing a layer with two hands in Photoshop

Additional images showing off Adobe’s support for multi-touch applications

NextWindow releases multi-touch accuracy with TruRange technology

NextWindow released TruRange technology. TruRange accurately resolves multiple simultaneous touches on screen, allowing users to engage in true multi-touch functionality. In addition to traditional single-touch functions, such as drag-and-drop, TruRange provides real-time multi-touch data that can be interpreted as two-finger gestures such as pan, pinch, rotate and scroll, along with many other multi-touch functions used in gaming and entertainment programs. TruRange is ideal for screens above 15 inches and is designed for high-volume manufacturing. TruRange will be WHQL certified for Windows 7. http://www.nextwindow.com

Multi-touch support in Silverlight 3

Microsoft recently announced support for multi-touch in Silverlight 3. It’s apparently not available in the existing Silverlight 3 beta, but is a feature planned for the future. http://videos.visitmix.com/MIX09/T14F
Microsoft Research develops interactive PC in a dome
The Microsoft Research team behind the Surface and Sphere projects recently showed off a computer that projects images onto an overhead dome and lets users control the experience with their hands in mid-air. For now, the project is called “Interactions with an Omni-Directional Projector”. http://research.microsoft.com

Microsoft Surface expands partner program to include Europe
In early March at CeBIT, Microsoft announced expanded commercial availability of Microsoft Surface to 12 select markets in Europe, Middle East and Africa (EMEA) and broadened its developer partner ecosystem to support those additional markets with local, relevant content. Previously available for purchase by companies in the US and Canada, Microsoft Surface is now also available in Austria, Belgium, France, Germany, Ireland, Italy, Netherlands, Qatar, Spain, Sweden, the United Arab Emirates and the UK.

The Microsoft Surface partner program has expanded to include more than 120 partners from 11 countries, developing applications that use the unique attributes of surface computing. Following is a list of select partners based in and/or supporting these new markets and examples of applications developed:

- Avanade is a global IT consultancy dedicated to using the Microsoft platform to help enterprises achieve profitable growth. Avanade has developed several solutions for Microsoft Surface, primarily for enterprise customers in the retail, consumer goods and finance sectors. Accenture and Avanade have developed a Microsoft Surface wealth management application for use in financial planning, providing users with tailored retail banking services, estate planning and investment management.

- EMC Corporation is a global provider of information infrastructure technology and solutions. EMC Consulting helps organizations create innovative user experiences and designs to transform information into consumable and personalized views. With expertise in retail, finance, entertainment and utilities, EMC Consulting is developing applications for Microsoft Surface that include an enterprise search-enabled FAST application that transforms search into an efficient, effective and enjoyable search tool.

- Infusion Development is a Microsoft Surface reseller that provides end-to-end solutions for clients in financial services, retail, healthcare and government industries. Infusion develops and supports Microsoft Surface applications that integrate with key Microsoft products and business systems including an application that allows users to navigate real-time, 3D data using Microsoft Virtual Earth, zooming in and exploring a variety of information.

- InterKnowlogy is developing solutions for healthcare, travel and tourism, government services, and manufacturing industries. One of the many applications developed by InterKnowlogy is a medical
application that allows doctors and patients to review surgery and procedures collaboratively, exploring 3D images with their hands and gestures.

- IntuiLab is developing solutions for Microsoft Surface for a wide variety of industries including public sector, retail, banking and media. IntuiLab is demonstrating an innovative banking application for Microsoft Surface that will provide customers with an entirely new, collaborative banking experience.

- Razorfish, a digital marketing agency network, is developing applications for the automotive, financial service and telecommunication sectors. Razorfish is represented by the agencies Neue Digitale / Razorfish in Germany, WYSIWYG in Spain, Duke in France and Razorfish in Great Britain. Applications include providing banking customers with instant access to product information and features that can be explored on their own or collaboratively with bank employees.

- Sariamo is designing applications for the automotive, retail, broadcasting and tourism industries, transforming the experience of taking a cruise from booking to bon voyage. Customers will be able to use Sariamo’s application for Microsoft Surface to explore and compare cruise options before making their purchase; while on board, cruise guests will be able to explore areas of the ship and plan activities.

- Telefónica I+D is working on the development of Microsoft Surface applications for the retail, banking, digital signage, leisure and entertainment sectors. The Telefónica flagship store in Madrid, Spain, features a Microsoft Surface application that provides customers with a personalized shopping experience, enabling them to access information about multiple mobile devices by simply placing them on the display.

- T-Systems Multimedia Solutions is combining Microsoft Surface with modern information and communication technologies to provide content and services. Hotel guests will be able to use T-Systems Multimedia Solutions’ application to plan their day without leaving the hotel lobby, putting the attractions of the city they are visiting at their fingertips.

- Vectorform is a global partner developing NUI interactive experiences on Microsoft Surface for multiple industries, including automotive, education, hospitality, financial services and entertainment. Vectorform has developed a wide range of applications, including one that enabled on-air TV personalities to analyze this year’s U.S. presidential election – viewing maps, exploring trends and examining voting patterns, all with the flick of a finger.

Microsoft is at the forefront of developing surface computing products that push computing boundaries, deliver new experiences that break down barriers between users and technology, and provide new opportunities for companies to engage with people. [http://www.surface.com](http://www.surface.com)
Microsoft to buy 3DV Systems

Microsoft is reportedly close to buying Israel’s 3DV Systems, an Israeli start-up whose technology allows a gamer to control a system through nothing more than a hand gesture. According to a report in the Israeli newspaper Haaretz, Microsoft may be willing to spend around $35 million to acquire the company and its technology, which uses a depth-sensing camera to record a gamer’s motions. 3DV showed its plans for the technology in December 2007, but has yet to announce a partner that will bring the technology to market, although Microsoft has used the systems on a small scale in its research labs.

MultiTouch launches the first modular multi-touch LCD screen

MultiTouch launched the world’s first modular multi-touch LCD screen that can be used to create large tables and wall screens. Screens made of MultiTouch Cells can be used simultaneously by any number of users. The Multitouch Cell works in all light conditions. The Multitouch Cell is available in 32 inches and 46 inches, as Full HD or HD-ready LCD versions. The Cells can be positioned in portrait or landscape mode and can be composed into large multi-touch walls or table screens. The MultiTouch Cell uses a LCD display and has advantages compared to current projector-based systems improving in durability (50,000 vs. 3000 hours), in image resolution and contrast, color quality, and in ease of setup and maintenance. The MultiTouch Cell allows the direct use of hands, for example to play games, sketch, manipulate, and play around with maps, pictures, and videos. With these qualities it is a tool to interact with media in an engaging way for visual communication of products and corporate identity, information centers, edutainment, group work applications, and control rooms. MultiTouch Cells includes a high-performance system for tracking any number of hands on the screen at 60 frames per second, both in bright daylight and dark environments. This is a truly multi-touch system that tracks not only points but actual fingers and hands and therefore facilitates richer and more engaging interaction. http://www.multitouch.fi
Idealum releases ruggedized high-resolution multi-touch table for museums

Idealum, an exhibit and media design firm, announced the release of the first ruggedized multi-touch, multi-user table built specifically for museums. The MT Table supports multi-touch and multi-user interactions. It has a bright 50-inch (diagonal) surface with a high resolution (1280x720) display, which is higher than Microsoft’s Surface multi-touch table. The large display also makes it easier to facilitate multiple simultaneous visitors interacting with computer programs through the use of multi-touch gestures. Visitors can use hand gestures to manipulate images or media or to interact with computer-based programs. The table, which stands 31 inches tall with heavy duty locking casters, is wheel-chair accessible and meets standard ADA requirements for height; an important consideration for museums. The table is automated and can safely shut itself down when the museum closes for the day. The MT is also incredibly durable with a frame built of aircraft-grade aluminum and a surface of thick, tempered glass. All of the components of the MT Table are industrial grade and built to withstand the demands of busy museums, including hands-on science centers. Idealum has partnered with Natural User Interface (NUI), a Swedish technology company specializing in multi-touch solutions to provide the base software package. Each table comes with NUI’s Snowflake Software a fast and reliable gesture recognition multi-touch software package. This software allows developers to create their own applications with Flash, C/C++/C#, Java, Python, and other programming languages. The MT table also includes TouchEarth (Google Earth with a multi-touch interface). Idealum is currently developing custom software for The Don Harrington Discovery Center in Amarillo, Texas and Vulcan Park and Museum in Birmingham, Alabama. These museums will have the first two tables, with installations scheduled for March. The installation for Vulcan Park and Museum will include two multi-touch kiosks making it one of the first permanent exhibits in the world to use multi-touch technology throughout the gallery space. [http://www.idealum.com](http://www.idealum.com)

**IMG and LM3LABS introduce interactive holographic assistant**

IMG and LM3LABS will jointly present their interactive holographic assistant at the Interactive Display Show in San Jose in late April. The product is to be deployed in the US over the next months. [http://www.lm3labs.com](http://www.lm3labs.com)
MIT Media Labs and Taco Labs collaborate to develop Siftables interaction platform

Siftables aims to enable people to interact with information and media in physical, natural ways that approach interactions with physical objects in our everyday lives. As an interaction platform, Siftables applies technology and methodology from wireless sensor networks to tangible user interfaces. Siftables are independent, compact devices with sensing, graphical display, and wireless communication capabilities. They can be physically manipulated as a group to interact with digital information and media. Siftables can be used to implement any number of gestural interaction languages and HCI applications. The Siftables interaction platform is a collaboration between the MIT Media Labs and Jeevan Kalanithi of Taco Lab. [http://web.media.mit.edu/~dmerrill/siftables.html](http://web.media.mit.edu/~dmerrill/siftables.html)

_A physical sorting task, with nuts and bolts (left), manipulating a physical mockup of Siftables (center), and interactions with the first working prototype (right)_.

National Taiwan University researchers develop secrecy tabletop

Researchers at National Taiwan University published a paper detailing how they developed a tabletop that allows poker players to breathe more easily. In the real world, a physical tabletop provides public and private needs for people around the table. For competing scenarios such as playing a poker game or running a price negotiation around a tabletop system, privacy protection is obviously an indispensable requirement. In this work they developed a privacy-enhanced tabletop system composed of two kinds of displays, the tabletop surface and the virtual panel. All users share the large tabletop surface as a public display while every user is provided with a virtual panel emerging above the tabletop as a personal display for viewing private information. The virtual panel is an intangible, privacy-protected virtual screen created by a special optical mechanism, which offers several promising characteristics, making it perfect to be integrated into a tabletop system. Firstly, they introduce a novel display technique, the virtual panel, into a tabletop system to build a privacy-enhanced tabletop system. Secondly, an analysis on display optics of the virtual panel is presented to explore other potentials of the display and to claim the feasibility of the proposed combination. Thirdly a computer vision-based interaction technique is proposed to provide direct-touch interaction for the virtual panel. Finally, they discuss a wide range of considerations on designing the user interface and interaction for the virtual panel. [http://www.ntu.edu.tw](http://www.ntu.edu.tw)

_The users are playing poker on the privacy-enhanced tabletop system (first prototype). Note that the image of the virtual panel is retouched for clarity._
**Mindstorm adds multi-touch imagery to website**

London-based Mindstorm is known for its use of innovation leading-edge technology. The company was founded by two Danish entrepreneurs, Kenneth Siber and Thomas Jensen who in 2002 identified a need for an interactive surface and worked to deploy solutions in practical settings. Privately funded, the company offers a wide range of software technology solutions to businesses ranging from retail and hospitality to corporate branding and events. Mindstorm's solutions are already in use in a variety of capacities around the world. The company recently added numerous video examples of their work to their captivating website. [http://mindstorm.com](http://mindstorm.com)

**NUI Suite Snowflake multi-touch software product demonstrated on multi-touch wall surface in UK**

NUI Suite Snowflake multi-touch software was demonstrated in the UK at the Event Show on an interactive multi-touch wall surface by Arcstream AV on January 21 and 22, 2009. Images from the UK demo highlight the versatility of the software. [http://www.multitouch.nl](http://www.multitouch.nl)
Embodied Media shows off interactive installation with spinning table
Australia-based Embodied Media introduced a new interactive installation in late February at the State Library of Queensland in Brisbane. The artistic work investigates the cultural dimensions of sustainability. A large circular table spun by hand and a computer-controlled video projection falls on its top, creating a blend of physical object and virtual media. Participants’ presence around the table and how they touch it is registered, allowing up to five people to collaboratively “play” this immersive audio-visual work. According to artistic director Chris Barker, the work “seeks to interrogate our impulses to initiate research and asks what kind of resources and knowledge will then help us learn that which we will need. It does this by considering the journey from information access via embodied learning towards common empowerment and ultimately action”. [http://www.embodiedmedia.com](http://www.embodiedmedia.com)

On the left is a participant with the Table-top Interface; on the right is an image of the interface screen.

Test images on a spinning table can be manipulated by touch.

Synaptics is granted a patent for ChiralMotion gesture technology
Synaptics announced that the United States Patent and Trademark Office has granted it US Patent # 7,446,754, which protects Synaptics’ ChiralMotion gesture technology intellectual property. Synaptics’ ChiralMotion gesture technology is well-suited for devices such as notebooks, feature-rich mobile handsets, personal navigation systems, and personal media players that require easy control of entertainment, music, and other digital files. For example, ChiralMotion on a TouchPad interface makes scrolling through long documents or webpages on a notebook PC intuitive and easy. To reverse the direction of controls such as scrolling or zooming, users simply reverse the circular motion of their finger. [http://www.synaptics.com](http://www.synaptics.com)
NOR /D develops TouchKit

TouchKit is a modular multi-touch development kit developed by NOR /D and produced with the support of Eyebeam Atelier, with the aim to make multi-touch readily available in an open source fashion. TouchKit is comprised of software and hardware components. For both they provide the source files and welcome you to use, study, and appropriate the code and schematics. The goal is to make TouchKit a plug-and-play solution for simple projects and an easily extendable base for experimental and cutting-edge endeavors. http://touchkit.nortd.com

Strukt Design Studio introduces interactive Struktable

The Struktable is an interactive installation built by Strukt to develop multi-touch applications. It can be rented for events or permanent installations with custom software developed for individual needs. With its 70-inch display size, the Struktable is built for simultaneous interaction of up to 8 people. The touch-sensitive surface recognizes unlimited finger touches at the same time - therefore, users can interact more intuitively. A portable design makes it versatile for diverse applications: product presentations at trade fairs, interactive game-stations at conferences, or information terminals in public space. http://strukt.com/2009/struktable/
**Flexpoint adapts its technology for sports products**

Flexpoint Sensor Systems is working closely with a manufacturer to develop several sports-related products that the company anticipates could be brought to market before the end of the year. The products will include sensor technology for bowling and golf shoes, bowling gloves and golf club shafts. The products will be used to help improve an individual’s performance. Among other things, the glove will measure release angle, and the shoes will measure distribution of weight, while the club shaft measures flexibility, speed and angle. There are currently over 70 million recreational bowlers and 2.9 million league bowlers in the United States and over 100 million worldwide, with revenues from bowling reaching over $10 billion a year. There are also 13 million golfers in the United States and over 60 million worldwide. Flexpoint Sensor Systems manufactures a patented cutting-edge flexible sensor that has also proven to be an extremely durable switch. The single-layer Bend Sensor product allows for the measurement of mechanical movement, air flow, water flow or even vibration. It can be used as a range of motion sensor, or as a durable and reliable switch in most harsh environments. Flexpoint serves numerous industries including automotive, medical, industrial controls and more. [http://www.flexpoint.com](http://www.flexpoint.com)

**UPEK unveils SlimPack technology for fingerprint sensors in mobile devices**

UPEK announced the availability of SlimPack packaging technology, offering breakthroughs in size, power consumption, durability and cost that enable easy integration and broad adoption of UPEK fingerprint sensors into mobile devices. UPEK’s TouchStrip fingerprint sensor has been integrated into millions of mobile devices allowing users to protect and access information with the simple swipe of a finger. Now with SlimPack packaging technology, the TouchStrip TCS5 fingerprint sensor is more compact and features the thinnest profile of fingerprint sensors in the market, ideal for integration into mobile phones that require sleek industrial designs. Not only are fingerprint sensors with SlimPack technology easy to integrate mechanically, but they also consume less power in order to optimize battery life. SlimPack technology features UPEK’s SteelCoat protective coating that is six times more robust than that of competing swipe fingerprint sensors for protection from the wear and tear of a touch-based user interface. SlimPack technology’s water resistance also allows for easy integration into various waterproof industrial design configurations. [http://www.upek.com](http://www.upek.com)

**Atrua granted patents for fingerprint touch control technology**

Atrua Technologies announced that the United States Patent and Trademark Office recently granted three additional patents to Atrua Technologies for fingerprint touch control technology. Two of these new patents cover methods for using a fingerprint sensor as an input device to control and navigate a user interface. The third patent covers anti-spoofing technology that further strengthens the protection provided by biometric authentication. Mobile device makers have found compelling advantages in using Atrua’s Made-for-Mobile fingerprint sensor as a small and highly responsive intelligent touch control device that works like a mini touch pad or scroll wheel in addition to providing biometric authentication. Out of more than 40 mobile handsets launched with Atrua’s fingerprint touch control since the beginning of 2007, over 75% use Atrua’s enhanced touch control features. Atrua’s recently granted fingerprint touch control patents cover use of the fingerprint sensor to emulate enhanced input devices such as a mouse, joystick, steering wheel, scroll wheel, navigation bar, or pressure-sensitive button. Atrua’s anti-spoofing patent covers technology that guards against fake finger spoofing attempts by analyzing certain properties of real fingers in order to distinguish them from fake fingers. [http://www.atrua.com](http://www.atrua.com)

**AuthenTec demonstrates new touch-powered mobile device features**

AuthenTec), the leading provider of fingerprint sensors and solutions for today’s mobile phones, demonstrated its newest wireless products and technologies for key cell phone OEMs and wireless carriers. They include the company’s new TrueNav navigation feature that translates 360 degrees of finger movement across AuthenTec’s sensor into touchpad-like control for today’s mobile phones, and new QuickLaunch personalization feature that allows cell phone users to quickly launch their favorite programs, websites, cell phone applications or speed dial with the simple swipe of a finger. AuthenTec also demonstrated its durable TouchStone packaging technology, recently incorporated into Fujitsu’s new PRIME Series F-01A waterproof cell phone. [http://www.authentec.com](http://www.authentec.com)
Displaybank brings out “Touch Screen Panel Patent Trend Analysis” report

The touch screen panel industry is showing good results even though demands for home electronics including displays are radically decreasing due to the global economic slowdown. Nissha, the number 1 touch window maker employed in mobile phones, from Japan recorded 20.3% increase in sales in Q4’08 compared to Q4’07. The sales of electronics touch window products recorded 93% increase. Young Fast and J Touch, two of top five touch screen panel makers in Taiwan, also announced increases in sales in 4Q 2008. Digitech Systems, a leading touch screen panel maker in Korea, is projected to have a large increase in sales in Q4’08 compared to Q3’08 as well. The report studied and analyzed touch screen panel related patents in Korea, US, Japan, and Europe that were issued before June 14, 2008. It sorted 5,584 valid data from a total of 23,569 raw-data. So, there were a total of 2,938 patents regarding the touch screen panel itself, which accounted for 52% of the total. Patents regarding parts accounted for 23% and user interface accounted for 25%.

NanoMarkets publishes report on indium tin oxide and alternative transparent conductor markets

Indium tin oxide (ITO) is the most widely used transparent conductor in the display industry and has also found important uses in photovoltaics, lighting and various kinds of optical and conductive coatings. However, the choice of ITO is not usually made comfortably. ITO is a relatively expensive material and it has mechanical limitations in certain applications. The reason why it is so popular is primarily because there are few other materials that have such an optimal combination of transparency and conductivity. As a result, there is an accelerating effort by both materials firms and research groups to find materials that can meet or beat the performance of ITO as a transparent conductor, but at lower costs and with more physical resilience than ITO can offer. There have been significant changes in end user markets since NanoMarkets previous ITO report was published. The worries about the ITO market being hit by indium priced at $10,000 per kilo have dispersed as commodity prices have fallen. The display industry into which so much ITO is sold is suffering as the result of the financial meltdown and two of the remaining growth sectors within displays - flexible displays and touch-screen displays - just happen to be areas where ITO use faces some of its biggest challenges. Meanwhile, OLED lighting and thin-film photovoltaics, two other technologies that have seen considerable commercial progress in the past year, should be natural opportunities for ITO, but in many cases applications developers in these areas are actively looking for alternatives to ITO. With all this in mind, this report gives an up-to-date analysis of how the alternatives to “ITO classic” are succeeding in the marketplace. It surveys the current role of other transparent conductive oxides, with special attention being given to zinc oxide, a material that is rapidly rising to prominence for electronics applications. It also reviews the role that conductive polymers will have as an ITO replacement. This report gives an account of the future role of nanomaterials and exotic composites as ITO substitutes. This is especially important because nano-engineered materials hold out the best prospects for a transparent conductor that can surpass ITO, not just in terms of its physical characteristics and price, but also in terms of transparency and conductivity.
Infiniti Research forecasts high growth for mobile touch-screen technology

The touch-screen technology market will have a major influence on the mobile handsets industry in the near future according to a new report from Reportlinker. Though touch-screen technology has been in existence since the 1980s, it has come in to prominence only after the launch of the iconic Apple iPhone. Touch-screen technology has also seen rapid growth in other segments like PCs, kiosks etc. much before the launch of the iPhone or the LG Prada. The current market for touch screens is primarily driven by mobile handsets, portable gaming consoles, PDAs and portable navigation devices (PNDs). The report forecasts the market size of global mobile touch-screen technology market over the period 2007-2012. It includes a detailed study of the market size and key players. The report analyzes the market by technology where in, it highlights the types of touch-screen technologies that are used for manufacturing mass touch-screen mobile phones. The report also discusses the penetration of touch-screen technologies into the mobile handsets market. The report helps in identifying and estimating growth in various types of touch-screen technologies. Comparisons of the most used/top three technologies under certain parameters are also included in the report giving a clear picture on the pros and cons of each technology. The report also highlights some of the other influencing technologies, which are a part of commercialized touch-screen technologies. In addition, the report also explains the growth drivers and inhibitors of mobile touch-screen technology market and identifies some of the suppliers, future touch-screen technologies and trends in the mobile market. http://www.reportlinker.com/p0109162/Mobile-Touchscreen-Technology-Market-2007-2012.html

Strategy Analytics identifies consumer preferences for TV media controllers

According to a recent Strategy Analytics survey, TV viewers have identified point and click controllers, such as Nintendo’s Wii Remote, as the best type of control device for the next generation of TV-based media browsers. The Digital Home Observatory report, “Consumer Imperatives for Digital TV Media Browsers”, found that PC-style keyboards ran a close second in popularity, followed by traditional TV remote controls that use either on-screen keyboards or alphanumeric keypads. Voice control, often promoted as the future of the man-machine interface, was considered the least appropriate option by those surveyed. “Nintendo’s success with the Wii games console is clearly having an impact on other aspects of digital home user experience,” says David Mercer, VP, Digital Consumer Practice. “Its motion-sensitive, point-and-click controllers have clearly struck a chord with consumers – not just in video games, but for other big-screen entertainment applications, as well. By contrast, promoters of voice control technologies face a major challenge to persuade users of their advantages.” This survey was conducted in the US in December 2008, with 500 mid to high-tech consumers. http://www.strategyanalytics.com

SensAble’s new FreeForm 3D modeling software speeds design-for-manufacture

SensAble Technologies, a provider of 3D modeling applications, haptic devices and toolkits, announced the availability of a major new version of its FreeForm 3D modeling software. With new design functionality and expanded interoperability, the new FreeForm version 10 builds upon its strengths for designing complex organically-shaped products with enhancements that let product designers strike the perfect balance between aesthetics and manufacturability. New features allow faster design iteration and preparation of intricate models with precise surface details and textures to meet downstream manufacturing requirements for cost-effective computer aided manufacturing such as RP or milling. For example, designers can quickly calculate the surface area of decorative items that will be gold plated while they sculpt – allowing them to keep the cost of materials within specification. Additionally, designers can fix draft – required for mold release – to select areas of organic models in seconds, typically an extremely time consuming or impossible task in parametric modelers. With FreeForm, users model more intuitively through the industry’s only use of haptics (touch-enabling) for product design. Instead of holding a computer mouse, FreeForm users hold a PHANTOM force-feedback haptic device – literally feeling the resistance on their hand as they nimbly sculpt intricate designs, such as grapes and vines or apple blossoms on juice bottles. Because it is based on voxels, FreeForm also removes the constraints of topology – mathematical definition, geometry format, and order of operation – of traditional mathematical-based modelers, further enhancing its ease of use. http://www.sensable.com
Atmel targets mobile devices with low cost 4-channel capacitive touch button controller

Atmel Corporation announced a convenient, easy to implement, low cost touch sensor IC, which brings capacitive user interfaces to price-sensitive consumer and mobile devices. This AT42QT1040 device is available in a 3x3mm VQFN 20 pin package, making it ideal for use in mobile phones and other handheld devices where PCB space is at a premium. In low power mode the AT42QT1040 draws only 31μA from a 1.8V DC supply, allowing capacitive sensing to be added with minimal impact on battery lifetime. The AT42QT1040 is the latest solution from Atmel’s touch sensor division, which develops capacitive touch button, slider, wheel and touch-screen controllers. The AT42QT1040 includes 4 digital output channels, enabling per-channel indication on touch detection. The IC can also be configured using one channel as a proximity sensor, enabling “hidden-until-lit” user interfaces where the device detects the presence of a finger some distance away from the keypad. The AT42QT1040 is based on Atmel’s patented QTouch charge-transfer sensing method. This robust technology uses spread-spectrum modulation to achieve high immunity to electrical noise. Atmel’s patented Adjacent Key Suppression (AKS), technology, essential for tight-pitched keys, is used to ensure that only the intended key is activated by the touch of a finger. Long-term reliability is achieved because the device automatically calibrates on power-up and always stays calibrated even if there is a build-up of moisture or other contaminants on the touch surface or if the overall system is subject to aging. Individual key sensitivity can be configured to support a range of front panel thicknesses and materials including glass or plastic up to several millimeters thick. Electrodes can be made from copper, silver, carbon, indium tin oxide (ITO) or any other conductive material. Widely different electrode sizes and shapes are possible, giving the product designer great flexibility to tailor the user interface. The device has two power modes: a low power mode, which is ideal for small, battery-driven devices; and a fast response mode, which provides minimum response time for applications where low touch latency is essential. To aid product development the AT42QT1040 has a debug mode in which internal data from the chip can be accessed. The ability to monitor the behavior of the device in this way means that designs can quickly be evaluated and tuned resulting in a shorter product design time frame. [http://www.atmel.com/touch](http://www.atmel.com/touch)

ARX brings out new electronic signature legislation guide

ARX (Algorithmic Research), a provider of digital signature solutions, announced the creation of eSignatureLegalWiki, an online, up-to-date, and collaborative guide to international electronic signature legislation. ARX established eSignatureLegalWiki in order to address the pressing need for a single and inclusive resource providing the most up-to-date information on electronic signature legislation. Inspired by Wikipedia, the free encyclopedia, the project was put together via a collaboration of lawyers, users, and electronic signature experts from around the globe. Since the wiki format allows every individual that accesses it to contribute or modify content, the eSignatureLegalWiki will be constantly enhanced, representing the most timely information on electronic signature legislation throughout the world. [http://www.arx.com](http://www.arx.com)

Rocketlife introduces touch solution for kiosks, photo lounges and retail sites

RocketLife announced today that it is introducing “RocketLife Touch”. RocketLife Touch is a new photo creation and merchandising product for the next-generation touch screen experience for kiosks at retail sites, photo lounge kiosks, and touch screen computers. Utilizing RocketLife patent-pending technologies, such as ultra-fast import of hundreds of photos, multi-layered photo themes with new enhancements, Smart Arrangement Technology, and 3D Digital Merchandising, RocketLife Touch expands touch capabilities to a variety of new venues and environments for rich photo product creation, from collage prints and posters to professional designed lay-flat photo books. RocketLife Touch uses advanced software techniques (such as high-speed assembly language) to create the quickest, most responsive system, so that a customer’s experience is fast and fluid. This, combined with advanced themes, graphics, and compositing capabilities, gives RocketLife Touch its unique power and creativity. RocketLife’s award winning Smart Arrangement Technology populates every product in just seconds, providing the consumer with a fun and exciting shopping experience. Consumers see their creations come alive with RocketLife’s powerful 3D Digital Merchandising fluidly showing the changes they make on each product in real-time. [http://www.RocketLife.com](http://www.RocketLife.com)
Chilin Technology demonstrates new digital signage product line
Chilin Technology announced its new line-up of digital signage display products including high-brightness outdoor displays, large-format touch screens and all-in-one systems with integrated PC. The Chilin 57-inch touch display utilizes Chilin’s proprietary approach to touch technology. It is ideal for way-finding applications, customer information kiosks and other digital signage applications that require a large but cost-effective touch-enabled display. The Chilin 42-inch is a narrow-bezel LCD for video wall applications. With the narrow 15mm bezel, these bright 1080p LCD displays can be configured to extend the image onto a large video wall of up to 6x6 displays with no additional external processing. The Chilin 52-inch transflective LCD is for outdoor and high-ambient-light digital signage applications. This display technology allows for LCDs to be used in outdoor digital signage using the ambient light to improve brightness and contrast. http://www.chilin.com.tw

Jupiterbay installs information kiosks in technical college
Jupiterbay, a full-service integrator of digital signage and displays, is making it easier for students and visitors to find their way at St. Cloud Technical College in St. Cloud, MN, with touch-screen kiosks that provide interactive maps and a calendar of campus events. Placed at bustling entrances throughout the college, the five Jupiterbay kiosks assist in navigating the sometimes-confusing building layout of 46,000 square-feet. And, because the kiosks are linked to the school’s R25 scheduling software, they also allow students to view St. Cloud’s calendar of events. By touching a listing, the user is automatically provided details and directions to the location of the selected event. The kiosks can also communicate what’s on the meal schedule, and plays a promotional video of the school as well. Plans are underway to eventually include specific information by department. http://www.jupiterbay.com

Nation’s Restaurant News publishes special edition on kiosks
The NRN 50 is a special edition on kiosks. It covers how quick-service operators are using kiosks to deal with slow-moving customer lines. The typical kiosk in a quick-service dining room is a computer-based device networked to the store’s point-of-sale, or POS, system. Customers press a touch screen interface to navigate through screens that depict various menu choices. They pay by swiping a credit card into the machine or, in some cases, by inserting cash. The kiosk sends the order to the kitchen and gives the customer a numbered receipt to claim the order at the counter. Observers say acceptance and use of self-service kiosks are soaring in sectors like banking, transportation and retailing but are not yet widespread in food service. In mid-2008, IHL said transactions at self-service kiosks would surpass $607 billion in North America that year and more than triple to $1.7 trillion by 2012. Several operators who use kiosks agreed the machines not only bust lines but also sell add-on menu items more effectively than human order-takers. http://www.nrn.com
3M Touch Systems introduces optimized surface capacitive touch system for small displays

3M Touch Systems announced the availability of the 3M MicroTouch System SCT3250CX. This new surface capacitive touch system from 3M is optimized for retail and consumer applications, such as videophones, home automation, retail POP displays and small all-in-one devices, using 5.7-inch to 12.1-inch LCD displays. Competitively priced with 5-wire resistive touch solutions, this system provides superior surface durability and typically 11.5% higher optical transmission for device manufacturers requiring more reliable and brighter touch displays. Based on the newly-released 3M MicroTouch Controller CX, this touch system has been specifically developed to meet the demanding requirements of small display applications. With a reduced component count and slim 0.8x1.9-inch board, this USB-HID controller is up to 54% smaller and requires up to 25% less power compared to typical 5-wire resistive solutions, making it ideal for compact touch devices with limited board space and low power requirements. http://www.3M.com/touch01

Bergquist makes 4- and 5-wire resistive touch screens available at Digi-Key

Electronic components distributor Digi-Key Corporation announced that it is now stocking new 4- and 5-wire resistive touch screens from The Bergquist Company. In stock, these products can be purchased on Digi-Key’s global websites. Bergquist touch screens are also featured in Digi-Key’s print and online catalogs. Bergquist optimized 4-wire resistive technology solutions are rated for 10 million single point activations and feature enhanced coatings to increase brightness and reduce reflections. Benefits include high resolution, pressure sensitive activation (with stylus and gloved finger), resistance to dirt and water, low cost, and low power consumption. Applications include handheld devices, light industrial, and home appliances. Bergquist 5-wire resistive analog touch screens are ideally suited for durable, reliable performance in a wide variety of demanding physical and harsh-environment applications. Unlike other resistive technologies that must use opposing layers to create X- and Y-axis measurements, the Bergquist 5-wire utilizes the stable substrate of glass for both X- and Y-axis measurements. Electrically, the 5-wire operates by supplying five volts to ground and toggling in both directions, thus supplying the X- and Y-axis measurements. The sense line, or fifth wire, is connected to the top film substrate. When the top layer is depressed, making contact with the base layer, it picks up the voltage data and carries it to the electronics. Because the top layer is acting only as pick-up layer, it can tolerate resistive changes without impacting the reliability of the touch points’ accuracy from the base layer. For this reason, the 5-wire is able to withstand temperature, humidity, and mechanical stresses, and as a result, 5-wire touch screens are specified for 35 million activations. Other benefits include its high resistance to scratches, abrasions, and external contaminants as well as its superior image clarity and brightness. http://www.digikey.com

Nissha Printing partners with NXT on wave bending technology

Nissha Printing has concluded a worldwide exclusive licensing agreement related to bending wave haptic technology with the co-developer of this technology New Transducers Limited (NXT). The agreement covers exclusive marketing to be carried out for touch panels 8 inches in size or smaller for particular applications sold in major markets worldwide. In order to apply bending wave technology used by NXT for flat panel speakers as a haptics solution, Nissha undertook approximately two years of joint development. This technology has recently finally become feasible resulting in the conclusion of this agreement. DMAs (distributed mode actuators), consisting of piezoelectric elements and installed in the frames on the backs of touch panels, are activated sending vibrations to touch panels. Touch panels vibrate in a wavelike manner (bending wave), and these vibrations allow users to acquire sensations. By utilizing the features of this technology, they are planning to manufacture touch panels designed to be mounted in mobile phones, gaming gears, notebook PCs, and digital cameras, etc. Demonstration units will be used to introduce these products to end-customers or manufacturers from 2009, and they are aiming to commercialize these products sometime between the 4th quarter of fiscal 2009 and fiscal 2010. http://www.nissha.co.jp
Silicon Labs expands portfolio with high pin-count touch-sensing device

Silicon Laboratories announced the introduction of its C8051F7xx family of high pin-count MCUs for cost-sensitive, high I/O embedded systems. This family is the first to offer a new, patent-pending touch sensing feature that is robust, accurate, responsive and easy to configure. Offering up to 54 general purpose I/O pins and a 25 MIPS 8051 CPU, the C8051F7xx family brings a high level of processing power and flexibility to applications such as industrial controls, security systems, residential HVAC, home appliances, keyboards, cash machines and fax/printer/scanner front panels. The industry’s fastest touch sense on-chip peripheral uses a capacitance-to-digital converter (CDC) with a 40 microsecond acquisition time that when combined with the 25 MIPS CPU on the C8051F7xx enables sophisticated human interface functions, even when large arrays of touch sense elements are used. To combat issues in electrically noisy environments, the CDC offers best-in-class noise immunity, ensuring reliable performance. With up to 32 touch sensing inputs, featuring wake-on-touch, the MCU can be placed in a power saving mode and wake quickly upon touch to save overall system power in applications. An intuitive software GUI allows fast and easy configuration. And, an API library is provided for all common touch sense configurations such as virtual buttons, wheels and sliders. http://www.silabs.com/mcu

Oslo School of Architecture and Design researchers make invisible communications visible

An ongoing theme of the “Touch” project is about making invisible wireless technologies visible, in order to better understand and communicate with and about them. Touch is a research project that investigates Near Field Communication (NFC), a technology that enables connections between mobile phones and physical things. The researchers are developing applications and services that enable people to interact with everyday objects and situations through their mobile devices. The Touch project is based at the Oslo School of Architecture & Design and funded by the Research Council of Norway. At any one time, there may be dozens of objects sending and receiving radio signals, from Oyster cards to mobile phones and wireless routers in a multitude of overlapping and competing fields (see photo). The researchers are creating communicative material that uses dashed-line abstractions to visualize the presence of wireless technologies in the everyday environment. The system allows every field produced by an Oyster card or NFC enabled mobile phone to be “seen”.

Using simple abstractions such as the dashed line and the kinds of visual language that they have previously proposed for RFID allows them to quickly communicate aspects such as the spatial properties of wireless technologies that are often overlooked. They have been using these images in presentations for a while, to sensitize designers and students to the spatial and embodied properties of RFID, Bluetooth and WIFI. They are also experimenting with video, where the visualizations are part of an environment in a moving sequence. This is looking like a useful technique for making visual explanations of invisible materials. http://www.nearfield.org/
Cambrios announces strategic partnership with Chisso Corporation and Sumitomo Corporation

Cambrios announced that the company has formed a strategic partnership with Chisso Corporation and Sumitomo Corporation for commercialization of Cambrios’ ClearOhm coating material in the LCD industry. ClearOhm coating material uses industry standard wet coating equipment to produce a transparent electrode suitable for many applications in electronics, including displays. Sumitomo is one of Japan’s largest trading companies. Sumitomo is currently the exclusive distributor of Cambrios products outside of LCD applications in Japan and Taiwan. As part of this strategic partnership, Sumitomo will participate in the LCD area as well. Over the last two years, Sumitomo has been a business partner for Cambrios in launching products to the rapidly growing touch panel industry, the first market where Cambrios technology is being commercialized. http://www.cambrios.com

N-trig challenges ISVs to develop new hands-on computing applications

N-trig its first multi-touch application challenge for ISVs. The company is calling for innovative new software to be showcased at SID Display Week 2009, being held May 31-June 5, 2009, in San Antonio, Texas. N-trig is seeking application developers who can creatively integrate hands-on input into new application software, utilizing full multi-touch capabilities. The new beta application must run over Windows 7. N-trig is looking for developers to be creative, push the boundaries and further help to break down the barriers between people and their computers for a true hands-on computing experience. Working beta versions need to be submitted by April 17, 2009 and final applications by May 1, 2009. http://www.n-trig.com

Analog Devices launches MEMS motion sensor

ADI has developed a new motion sensing device for energy-constrained portable consumer products. ADI’s ultra low power ADXL345 three-axis iMEMS digital accelerometer extends battery life in portable consumer electronics, including cellular handsets, digital cameras and mobile gaming systems. Many of the most exciting features in today’s portable consumer electronics are being enabled by motion sensing technology. Both consumers and manufacturers are discovering the benefits of converting human movement and spatial awareness to a range of interactive system functions that enhance the user experience. Because every new feature introduced to mobile gaming systems, cell phones, digital still cameras and other battery-operated electronics taxes already stressed power budgets, Analog Devices has developed a new motion sensing device specifically for energy-constrained portable consumer products. The ADXL345 three-axis digital iMEMS (integrated micro-electro-mechanical system) accelerometer is the lowest-power device in its class, achieving an 80% power savings compared to competing three-axis inertial sensors. The ADXL345 also incorporates an on-chip ADC (analog-to-digital converter) that simplifies hardware configurations in wireless handsets, personal navigation devices and other mobile applications. http://www.analog.com

Fujitsu Microelectronics markets touch sensor controller

Fujitsu Microelectronics America announced that the company is now distributing a compact, flexible touch sensor controller from ATLab of South Korea. The FMA1127 controller converts capacitance generated by the human body and conductive touch pad to digital data - with no analog processing. This low-power, fast-processing, easy-to-implement capacitive touch controller is ideally suited for mobile phones, PDAs, remote controllers, multimedia players and other mobile devices. Digital touch sensor technology allows for easy, multi-touch, intuitive access and navigation. The controller is water resistant and can be implemented with a variety of materials, making the FMA1127 an ideal design choice for alarm systems, handheld health care products, and home appliances, or for other applications where the controller can replace mechanical switches and buttons. The FMA1127 is manufactured by Fujitsu Microelectronics at its Aizu-Wakamatsu facility in Japan using 0.25-micron technology. The controller was developed to compare reference and sensor input impedances to detect touch - all in the digital domain. The original touch sensor controller technology was targeted to replace conventional buttons, and has now been applied to touch screens and proximity sensors using ATLab’s DigiSensor, which measures imbalances in impedance caused by finger contact. Compared with most keypads in cell phones, the touch sensor controller’s DigiSensor enables thinner, lighter portable electronics products. http://www.fujitsu.com
AUO furthers development of touch panels for Microsoft Windows 7

AU Optronics is spurring up the release of Microsoft Windows 7 in the second half of 2009 through subsidiaries such as color filter (CF) maker Cando and system maker Qisda. Windows 7’s multi-touch function makes touch panels a necessary component for applications for the system. With the successful experience of capacitive touch panel with iPhone, notebook vendors are now looking for suppliers who can provide integrated services for developing capacitive touch panels for Windows 7. Cando’s first capacitive touch panel production line was completed in 2008, and AUO and Qisda are providing technological support for TFT LCD panels and LCD modules. Cando currently has a monthly capacity of 400,000 units of 12.1-inch capacitive touch panels, and the company estimates its monthly capacity to reach one million units in the first quarter 2010. Cando also is a strategic partner of Wacom for touch IC and software technologies. http://www.auo.com.tw

ZeykoAD selects Zytronic’s ZYBRID touch sensors for public systems

The new touch display systems are being installed in shopping hubs and in passenger concourses in the Seoul underground rail network, and appear similar to a scaled-up smartphone. Users can select from several features via the color display, which presents touch-sensitive icons in an intuitive, accessible layout. Information available includes local maps, shopping plans and travel timetables, as well as details of restaurants and other facilities. The terminals also provide public Internet access, as well as a VoIP phone handset allowing users to place phone calls by calling up a soft keypad on screen. When not in use the large display is able to present advertising, or other messages, which allows the operator to build extra sources of revenue. The rugged touch screen is in a 46-inch screen size, that was suited to bezel-free mounting enabling a pure glass, flat fronted design and easy to clean. http://www.zytronic.co.uk

Jumping Gym USA selects Softkinetic’s gesture-recognition technology

Softkinetic, a 3D gesture recognition solutions provider, announced that its technology will be included in new interactive games currently being developed by Jumping Gym USA, which owns and runs more than 50 family entertainment centers in Hong Kong. Softkinetic’s 3D gesture recognition software combined with a 3D depth-sensing camera is well suited to the arcade center environment as no physical controllers are necessary and it provides a very physical and immersive gaming experience. Softkinetic delivers a Software Development Kit that supports all available 3D cameras while offering a set of tools for video games and arcade developers. http://www.softkinetic.net

SMI Health and InfoSlate partner to educate patients with interactive touch screens

SMI Health, physician-owned point-of-care marketing firm, and InfoSlate, a leading physician-owned interactive digital media company, announced a strategic alliance to provide sponsored interactive patient education activities at the point of medical care. InfoSlate provides physicians’ practices with free handheld interactive LCD touch screens for their waiting rooms that deliver educational health content such as breaking medical news, information on 6,000 disease states and other health topics, and treatment options. SMI Health will leverage its network of 400,000 physicians in over 250,000 healthcare facilities to expand the interactive network and work with its clients, including pharmaceutical companies and Contract Research Organizations (CRO), to sponsor the educational content. The interactive screens are HIPAA-compliant and collect patient demographics including age range and gender. Each 10.0-inch LCD touch screen is fitted with LoJack Anti-Theft monitoring and a docking station for battery recharging. InfoSlate technology integrates easily with practice networks and only requires an Internet connection. Physicians can customize the screen’s home page to support in-office branding campaigns, and can also use the system as part of the check-in procedure. In addition to health content, patients can browse the Internet, access e-mail, and take online surveys. http://www.smihealthmedia.com
OMRON and Renesas Technology jointly develop touch sensor solutions

OMRON and Renesas Technology have reached an agreement to jointly develop capacitive touch sensor solutions. Based on this agreement, Renesas will integrate OMRON’s touch sensor technology into its R8C Family 16-bit microcontroller (MCU) products and supply touch sensor solutions for a wide range of fields, including household appliances and mobile devices. Renesas, for its part, has the world’s top market share in the MCU field. In particular, the R8C Family, to which OMRON’s touch sensor technology will be added, has a large share of the market for 16-bit MCUs in the consumer field due to the wide selection of packages and memory configurations available. By creating a hardware version of OMRON’s proven touch sensor technology in the form of a touch detection circuit device and integrating it into Renesas’ R8C Family of MCU products as a single chip solution, customers will enjoy the following benefits: enhanced system performance; reduced system power consumption; compact size, and reduced overall cost. The objectives of this joint development project are to achieve adoption of OMRON’s touch sensor solutions throughout the world market and to establish Renesas’ MCU products in a dominant position in the touch sensor market. [http://www.omron.co.jp  http://www.renesas.com]

CTL introduces innovative touch screen convertible netbook

CTL announced its new 2go Convertible Classmate PC. This is one of the first touch-enabled netbooks available in the US. It is designed for use as a laptop or a tablet PC, and is purpose-built for youth education. The 2go Convertible Classmate PC extends CTL’s netbook family – to three platforms – and further solidifies its position in the education arena. At $549, the 2go Convertible Classmate PC also is one of the lowest-priced tablets on the market. Like the clamshell-style product (the 2go Classmate PC and the Model IL1A), the 2go Convertible Classmate PC offers important ultra-portability features. It is small (8.9 inches wide) and lightweight (2.8 pounds). It is also designed for kids and is able to withstand accidental drops (drop proof to 50cm). It features a liquid-resistant keyboard, and a carrying handle (removable) for usage anywhere. Key among the 2go Convertible’s features is an 8.9-inch LCD screen (with 1024x600 resolution). The screen can be rotated and inverted, with all such movements supported by a high-performing accelerometer. The screen features resistive touch technology that also recognizes an individual’s handwriting and supports digital writing and drawing. A stylus is provided for navigation (e.g., select, move, drag and re-size), and for utilizing the 2go’s many built-in software capabilities, including an e-reader, with scrolling, panning, text-to-clipboard copying and zooming, as well as note-taking tools. The system is equipped with an innovative Quick Launcher. This also is a touch-enabled feature that provides shortcuts to a number of other pre-loaded applications, including powerful collaboration software, as well as a number of Internet-centric capabilities such as web researching, e-mail and instant messaging, and video, and MP3 streaming. [http://www.ctlcorp.com]

SMK develops capacitive touch panel with multi-touch input function

SMK announced the development and commencement of production of a capacitive touch panel with multi-point input and gesture input functions. The capacitive system is structured to sense changes in capacitance in the electrical charge on the sensing surface to read touched points. A soft touch with fingers on a touch panel will be sufficient to lightly operate the panel, freeing users from hard pressing as required with resistance sensing touch panels. Further, the provision of multi-touch input and gesture input capabilities makes gesture operations such as zooming in or out or page scrolling possible. On development of this product, we considered visibility of LCD panels and light operation feeling for products with built-in touch panels as the points of prime importance. For this, we sought compatibility of highly transparent and colorless visual performance and light input sensitivity, which used to be considered to be difficult, and finally established an exclusive production method successfully. In the future, SMK will try to supply modules comprising a touch panel with a decorative sheet glued together for more extensive application opportunities in small equipment. [http://www.smk.co.jp]
3M demonstrates “Dispersive Signal Technology” gesture recognition

3M Touch Systems demonstrated gesture recognition for 3M’s Dispersive Signal Technology (DST) platform and the 3M MicroTouch System DST2270DX product. A preferred touch interface for interactive displays ranging from 32 inches to 46 inches, the 3M MicroTouch System DST2270DX is well known to application developers for its fast and accurate touch response and reliable operation in the presence of contaminants. Developers can incorporate commonly requested touch gestures such as image pinching, expanding, zooming, and object rotation into their retail, hospitality, gaming and other public-access applications. This capability will incorporate standard gestures such as flicking, scrolling, and other pattern recognition-based gestures. [http://www.3M.com/touch](http://www.3M.com/touch)

3M introduces next-generation rugged touch solution

3M Touch Systems announced the availability of the 3M MicroTouch System SCT7650EX, 3M’s next-generation, price-competitive surface capacitive touch solution for vandal-prone, heavy-use environments. Three key product features offer display integrators an economic, user-safe, easy to seal, robust touch solution for unattended public applications such as ATMs, kiosks, and vending machines. First, the 3M MicroTouch System SCT7650EX is now up to 40% less expensive than 3M’s current 3M MicroTouch ToughTouch II system. Second, the SCT7650EX touch system still features optically-clear laminated glass-on-glass construction which provides superior impact resistance and 86.5% light transmission for brighter, crisper display images. And finally, now the SCT7650EX touch system uses a conductive adhesive-bonded flexible circuit tail in place of the traditional solder connections and wire leads designed to facilitate a superior liquid and dust seal between the touch sensor and display bezel. The 3M MicroTouch Sensor SCT7650’s laminated construction withstands the EN/UL 60950-1 impact resistance test and provides the necessary surface durability for most unattended, public-access environments. If surface breakage occurs due to extraordinary impact, the lamination helps isolate the glass shards between the touch surface and LCD to protect the user. In addition to providing high impact strength, the sensor construction can also include 3M Vikuiti Advanced Light Control Film (ALCF), which increases application security by restricting the display viewing angle and helping keep sensitive data private. [http://www.3M.com/touch](http://www.3M.com/touch)

InPlay Technologies enters into letter of intent for merger with U.S. Rental Housing REIT

InPlay Technologies announced that it has entered into a binding letter of intent to merge with U.S. Rental Housing REIT. The transaction is subject to final negotiation and execution of a definitive merger agreement, and InPlay stockholder approval within two months or so. [http://www.inplaytechnologies.com](http://www.inplaytechnologies.com)

Immersion sells CyberGlove division

Immersion Corporation announced the sale of its CyberGlove business to the private equity firm Shackleton Advisors. The sale is part of Immersion’s strategic initiative to divest its 3D product line and focus on its medical and touch lines of business. Financial terms of the deal were not being disclosed. The CyberGlove family of products is used to capture hand and finger motion and manipulate objects in virtual reality. The product family includes VirtualHand Software and four data glove models: CyberGlove, CyberTouch, CyberGrasp, and CyberForce. The base CyberGlove system is a wireless data glove that, in conjunction with its software, accurately captures the movement of a user’s fingers and hand, and maps it to a graphical hand on the computer screen, allowing users to “reach in and manipulate” digital objects as if they were physical. CyberGlove Systems’ products benefit customers by allowing them to more quickly prototype and animate in virtual reality, thereby saving time and money. [http://www.cyberglovesystems.com](http://www.cyberglovesystems.com)
Immersion delivers haptic medical simulation for minimally invasive stroke prevention procedure

Immersion announced the availability of new carotid intervention training modules for its CathLabVR surgical simulator. The new modules provide multi-modal (sight, sound and touch) virtual reality training for carotid angioplasty and stenting (CAS), a minimally invasive procedure performed to help prevent strokes. Powered by Immersion’s programmable high-fidelity haptic feedback, the modules provide lifelike simulation of an actual CAS procedure outside the operating room where doctors can practice and perfect their skills at this sophisticated technique prior to performing it on a live patient. Immersion’s new carotid module is designed for its virtual reality interventional catheterization CathLabVR Surgical Simulator (formerly the Endovascular AccuTouch System), allowing clinicians to practice many types of endovascular procedures such as coronary and peripheral vascular interventions, cardiac pacing, and cardiac valve replacements. Minimally invasive endovascular surgeries require careful attention to interpretation of fluoroscopic images as well as the subtle feel transmitted through guide wires, catheters, and other interventional devices. Benefits include Immersion’s TouchSense patented force feedback technology integrated with visual and audio responses to replicate the look and feel of surgery; comprehensive physics-based virtual models that closely reproduce patient anatomy; SmartCapture tool recognition that enhances realism by automatically recognizing and responding to instrument insertion and removal; the ability to insert and rotate up to four instruments simultaneously, and real-time display of fluoroscopic and cine images to provide realistic rendering. http://www.immersion.com/medical

Immersion delivers first-ever haptic medical simulation for new lung cancer diagnostic procedure

Immersion Corporation announced a new way to accurately and efficiently train pulmonologists and thoracic surgeons on a breakthrough emerging procedure for diagnosing and staging lung cancer. The maker of the industry’s only haptic-enabled bronchoscopy simulator delivered a new module, Endobronchial Ultrasound with Transbronchial Needle Aspiration (EBUS-TBNA). It provides realistic multi-modal (sight, sound, and touch) virtual reality training for this difficult but highly accurate procedure that diagnoses and stages lung cancer, the cause of the most cancer deaths worldwide. It is the first and only haptic-enabled endoscopy simulator designed for EBUS-TBNA. EBUS has been shown to be an effective tool for imaging and sampling mediastinal nodes. However, due to several factors such as an angled camera view and difficult to interpret ultrasound images, it requires intense training and can take over 50 procedures to learn. By using advanced virtual reality simulation to train, medical schools and institutions can provide a risk-free, cost-saving, and highly effective way for medical students, residents, and practicing physicians to master the EBUS procedure. http://www.immersion.com

Neonode completes financial restructuring and launches touch-screen subsidiary

Neonode, the Swedish mobile technology company, announced the launch of Neonode Technology AB, a new wholly owned subsidiary that focuses entirely on providing and developing optical touch screen solutions for hand-held devices. Neonode has recently completed a financial restructuring, including the conversion of debt to equity and a capital raise transaction. By launching Neonode Technology and completing the financial restructuring, the company can further increase its development resources in the field of optical touch systems for hand-held devices. The company, through its touch screen solution subsidiary, aims to be at the center of development of the next generation of hand-held touch screens. With its engineering design expertise, Neonode Technology also plans to help customers implement customized touch screen solutions. http://www.neonode.com
Wacom pen input enriches Corel Painter 11 experience

Wacom announced its support for Corel Painter 11, providing significant workflow advantages and numerous ways for users working with a Wacom pen tablet or interactive pen display to naturally explore and express their creative ideas as well as enhance productivity. Wacom’s natural, pressure-sensitive pen input solutions are ideally suited for the Painter 11 user. Whether creating a new painting on a digital canvas with some of Painter’s unique new artistic media or highlighting a digital photo with inventive pen-supported tools, a Wacom pen input device offers the control and interactivity that Painter 11 users seek. In addition to its artistic prowess, the Wacom pen offers ergonomic and control benefits to the Corel Painter 11 user. Since the pen is positioned in the hand in a natural manner and provides exceptional freedom of movement, those working with Painter and other creative applications find it offers superior responsiveness and physical comfort compared to alternative input devices. For example, when combined with a Wacom pen tablet, Painter 11's new RealBristle painting system has the uncanny ability to replicate the sensation and interaction between traditional paint and canvas. Wacom’s Intuos pen tablets and Cintiq interactive pen displays feature customizable ExpressKeys and Touch Strips for quick access to keyboard shortcuts and modifiers. These non-dominant hand features greatly enhance productivity by fully utilizing the user's hand that is not controlling the pen. Since the customized settings can be application specific, Corel Painter 11 users can create and save unique personalized settings for each individual application. For example, the undo command, resizing a brush or zooming in and out of a piece of art can easily be attributed to an ExpressKey or Touch Strip, allowing Painter users to break away from keyboard dependency and seriously focus on the work at hand. [http://www.corel.com](http://www.corel.com)

Sony patent shows surface-like wireless touch-screen printer

A Sony patent application titled “Image forming device, having an ejection tray, and a display is mounted to a cover” describes a flatbed inkjet printer with a large touch-screen display that wirelessly downloads photos when a digital camera is placed on top. Once the download is complete, users can manipulate their images directly on the touch screen and print them off, all through the one device. Sony’s invention is described as being equipped with storage for printer paper on the inside, beneath the hinged lid. While the wireless image transfer is certainly an attractive feature, it would not function unless you had a suitably equipped camera with a transmitter and receiver. This could be easily achieved by Bluetooth, but is far from common in current cameras.

Techsol LCD touch-panel computer features dual Ethernet ports

Techsol offers a cost-effective computer with a color, TFT LCD and touch panel and dual Ethernet ports targeting user interface (HMI) applications. This is a standard, off-the-shelf, ARM-powered, desktop device. Every unit is tested running Linux before it ships. Single units are available as development kits with full SW development tools and support. By designing with the Medallion system, manufacturers can effectively out-source the CPU design and Linux porting with no up-front NRE fees. That lets them concentrate on the hardware and software portions of their product. This computer with dual NICs can be patched into any equipment with an Ethernet port without having to run a second Ethernet line, or install a switch, saving time and money. [http://www.techsol.com](http://www.techsol.com)
Art Lebedev Studios shows off OLED-based keyboard customized for World of Warcraft
To illustrate its flexibility, the Art Lebedev Studios showed off a Optimus Maximus customized keyboard design created especially for use with “World of Warcraft”. Each key is a stand-alone OLED display measuring 10.1x10.1mm that shows the function currently assigned to it. Optimus’s customizable layout allows convenient use of any language – Cyrillic, Ancient Greek, Georgian, Arabic, Quenya, Hiragana, etc. – as well as of any other character set: notes, numerals, special symbols, HTML codes, math functions, etc. http://www.artlebedev.com

Luxeed shows off configurability of LED-based programmable keyboard
The Luxeed website identifies numerous examples of how their LED-based keycap solution can be customized to suit personal preferences. The keyboard comes with a programmable layout generator (shown in the top four images below). The lower images show how the programmed keyboard actually appears. http://luxiiium.com
Wacom releases interactive pen display

Wacom’s Cintiq 12WX delivers pen-on-screen capabilities that fit virtually any professional photographer, designer or artist’s digital workflow and budget. Wacom's wide-screen interactive pen display combines all the advantages and power of direct pen-on-screen input with a new low-profile, lightweight and flexible design. The Cintiq 12WX is aimed at professional creators of digital content looking to improve and streamline their workflow. Storyboarding for 2D or 3D animations, compositing for post production, designing graphics, as well as retouching photos are just a few of the many creative applications where the Cintiq 12WX will excel. The Cintiq 12WX is suitable in a variety of computer environments, especially those where users wish to work across multiple monitors. It is ideal as a companion monitor for a primary display, alongside other displays in a multi-monitor environment, or even by itself. Weighing just 4.4 pounds, its dimensions and styling make it an ergonomic product ideal for flexible integration into existing workplaces or use at a remote location such as a collaborative meeting at a client site. Combining the small size and flexibility of a desktop pen tablet with the natural hand-eye coordination of an interactive pen display, the Cintiq 12WX offers slimline dimensions comparable to Wacom’s Intuos3 6x11 pen tablet. The Cintiq 12WX features a 12.1-inch LCD wide-format display for direct pen-on-screen image editing, painting, sketching, navigating and collaborating. Like the Cintiq 21UX, the Cintiq 12WX enables near perfect hand-eye coordination. Users can work with the pressure sensitive pen directly on screen, providing resolution of 1280x800 pixels, 24-bit color depth and a wide viewing angle of 170°. A programmable Touch Strip is ergonomically located on each side of the display with presets to allow zooming and scrolling in various applications. These “on board” features significantly improve workflow and productivity by off-loading environmental controls to the non-dominant hand and allowing the user to focus on the pen with the pen hand. The patented, cordless and battery-free Grip Pen offers precise and advanced tool controls for realistic results due to the 5080lpi resolution and 1024 levels of pressure in both the pen tip and eraser. Tilt functionality is supported with angles of up to 60 degrees, allowing natural-looking pen, brush and eraser strokes. The Cintiq 12WX supports Wacom’s optional input devices such as the 6D Art Pen and Airbrush. [http://www.wacom.com](http://www.wacom.com)

Micro Industries releases retail’s largest interactive computer

Micro Industries, a specialist in interactive retail computers, introduced its biggest, most colorful product ever. A 65-inch addition to Micro’s line of popular 32-inch and 46-inch, high-definition computers, the Touch&Go Messenger 65 establishes a new standard for in-store, interactive messaging. Manufactured with “Advanced Retail Technology”, the new Messenger 65 is powered by an Intel Core 2 Duo processor to deliver performance and improved power efficiency. The system comes equipped with a 1080p, ultra-bright LCD with a viewing angle of 176 degrees, a 160GB hard drive, DVD/CDRW, and Windows XP. Also available are an IR touch screen, internal stereo speakers, and video options. The computer is retail-ready for interactive consumer applications, digital signage, store maps, advertising, messaging, product information, and demonstrations. Simple mounting options mean the Messenger 65 can be hung from a ceiling or a wall, or positioned on a countertop. Its dimensions are 64.6 x 37.6 x 7.4 inches, with a weight of 220 pounds. [http://www.wmicroindustries.com](http://www.wmicroindustries.com)

Colorado vNet provides worldwide weather information on the Vibe touch screen

Colorado vNet has integrated worldwide weather information into their home automation and distributed audio systems. With the Colorado vNet Weather Application, homeowners quickly view current weather conditions and hourly or 5-day forecasts on the same Vibe color touch screen used for controlling whole-house audio, lighting, climate, CCTV and security systems. Users choose from a list of previously viewed cities and easily add new locations by entering a zip code or browsing by country/state/city. In addition, homeowners have the flexibility to make any location the default or rename locations. A Weather Application Module and an Internet connection are the only requirements for adding weather to an existing Vibe system. [http://www.coloradovnet.com](http://www.coloradovnet.com)
TouchSystems releases 40-inch large-format interactive touch LCD monitor

TouchSystems announced the new P4050D 40-inch, large-format interactive touch LCD monitor. The new P4050D is a fully integrated interactive touch LCD monitor featuring the 3M Dispersive Signal Technology (DST) touch technology. The P4050D combines the performance and quality of NEC Display Solutions’ MultiSync LCD4020 and accuracy and durability of DST touch technology from 3M Touch Systems into a complete touch monitor solution. The new P4050D is ideal for high-use interaction and operation. With the 3M MicroTouch DST touch system users are said to get fast, accurate operation, a chemically-strengthened glass construction that delivers the ultimate in clarity and image purity, and unsurpassed performance and reliability. Customers can ensure their messages reach the audience in a variety of applications like public kiosks, airports, train stations, hotels, retail shops, restaurants, tradeshows, corporate signage, theaters, museums and more. The 40-inch display includes NEC’s Digital Signage Technology Suite (DSTS). [http://www.wmicroindustries.com](http://www.wmicroindustries.com)

Kommerz launches Arena3D mixed reality show tool

With Arena3D, users create individual communication tools from virtual 3D spaces and tangible models to communicate ideas, sell products, present companies or moderate workshops. The basis is the interaction with real, material figures on an action surface and a three-dimensional representation of content on the monitor. Incorporating the normal human perspective makes it possible to work in a simple, intuitive and flexible way and adds the emotional component to the plane of communication. Arena3D means communicating information in an exciting, emotional, flexible and intuitive way, incorporating both real and virtual worlds in equal measure and making the most of their respective advantages, according to the company. [http://www.kommerz.com.at](http://www.kommerz.com.at)

RMT introduces rugged fixed-mount PC for warehouse and shipping environments

The Duros 1214 fixed-mount rugged PC, the newest offering in RMT Inc’s Duros product line, was unveiled. Engineered to withstand the rigors of warehouse and shipping environments, the terminal features an ultra-rugged touch screen polysilicon display and all-in-one aluminum housing that eliminates the need for corded peripherals. It is also sealed to IP-65 and meets or exceeds MIL-STD-810F for drop, vibration, shock and altitude. The Duros 1214’s compact design means it can be mounted easily onto a variety of industrial machinery - including forklifts, pallet trucks and automated guided vehicles - with limited intrusion into valuable cabin space. The 12.1-inch 800x600 resistive touch screen display provides for faster and easier operator communication, without a stylus or keyboard. On the inside, the Duros 1214 is powered by the Intel Celeron M 1.0GHz processor and can run Windows XP, Embedded, or Vista, as well as Linux. Compact flash storage is also available up to 64GB and four USB 2.0 ports are provided. Designed with connectivity in mind, the Duros 1214 accommodates customer-specific applications through an Ethernet port, Bluetooth 2.0 and Wi-Fi with dual-diversity antennas. While its primary power source is tapped from the vehicle to which it is mounted, the Duros 1214 also features a built-in backup battery that provides up to 20 minutes of continuous use without power. This is helpful when changing the forklift battery or making last-minute entries after powering down the machinery for the day. [http://www.ropermobile.com/products/1214](http://www.ropermobile.com/products/1214)
Hanwha’s Duo for Laptop allows doodling on a standard 15.4-inch laptop
Hanwha’s Duo for Laptop turns a standard, non-tablet PC into a tablet PC. Hanwha Japan has just introduced this device, which sits on top of a laptop display and tracks digital pen movements via infrared and ultrasonic technology in order to add doodling functionality to LCDs that were never designed to understand touch input. The only limitation is that this seems to only work with laptops up to a 15.4-inch display. http://www.hanwha.co.kr

TabletKiosk intros MediSlate MCA i1040XT for healthcare professionals
TabletKiosk introduced its new MediSlate MCA i1040XT, which, among other things, is apparently the only such device with a sunlight-readable touch screen. The device is also ruggedized and rated for drops of up to four feet, and it’s fully sealed to resist spills and hold up to hospital disinfectants. It includes a Core 2 Solo ULV processor, 2GB of RAM, an 80GB hard drive, two hot-swappable battery bays, an optional 3G data card, and a barcode scanner, an RFID reader, a fingerprint reader, and a 2-megapixel webcam. http://www.tabletkiosk.com

Touch Book from Always includes removable tablet
The Touch Book from Always Innovating is an ARM-powered netbook that weighs less than two pounds and claims battery life of 10 to 15 hours. It also has a removable screen – it slides out of its keyboard dock and acts as a fully functional touch-screen tablet. When docked, the screen can lay out flat, and the keyboard can even be folded all the way under into an “inverted V” shape. There are also internal USB plugs to cut down on dongles, and the whole screen is magnetic for mounting on a fridge. The machine is running a Linux OS with a touchable 3D UI. http://www.alwaysinnovating.com

Corning to supply LG Electronics with “Gorilla” Glass for new mobile phone
Corning Incorporated announced that its Gorilla glass was selected as the protective cover glass for LG Electronics’ “Secret phone” (model: LG-KF750), and other models currently in development. Gorilla glass, an environmentally friendly, thin-sheet glass, functions as a protective window for high-end display devices. Corning’s Gorilla glass is designed so that after undergoing a chemical strengthening process, it provides device manufacturers with a highly durable, scratch-resistant LCD display cover. Because it is durable and scratch-resistant, Gorilla glass can be used for personal electronic devices, such as mobile phones and notebook computers, and is especially valuable for products featuring touch screen technologies. Corning Gorilla glass is available in a variety of thicknesses, from 0.5 millimeters up to 2.0 millimeters, providing flexibility in device design as well as glass processing. It is an environmentally friendly alumino-silicate glass produced with Corning’s proprietary fusion draw process. Fusion draw technology enables the production of uniform thin sheets with a pristine surface. It is also adaptable to scalable sheet sizes for optimal throughput. The result is a drawn surface that in many cases requires no additional finishing for some applications while providing a wide range of thickness options, low-surface roughness and superior flatness. http://www.corning.com
Zero-Bezel touch monitor awarded Advanced Display of the Year 2009

Tyco Electronics’ Touch Panel Systems (the office of Elo TouchSystems in Japan) announced that its 1900L/2200L Zero-Bezel touch monitors with acoustic pulse recognition (APR) touch technology have been awarded the Advanced Display of the Year (ADY) 2009, Display Module Category for their significant contribution to the flat-panel display (FPD) industry. The 1900L/2200L Zero-Bezel touch monitors developed by Tyco Electronics' Elo TouchSystems are the first zero-bezel touch monitors with a virtually 100% useable surface area. Combining state-of-the-art Elo TouchSystems APR touch technology, the zero-bezel design removes the frame, or bezel, of standard monitors to create a seamless glass surface. The slim and elegant dark gray body looks less like computer monitors and is well-suited for sophisticated spaces like boutiques and hotel lobbies. The easy-to-clean screen surface is resistant to water, dust and grease. [http://www.tycoelectronics.com/](http://www.tycoelectronics.com/)

Tyco Electronics introduces the Elo TouchSystems 15D1 all-in-one touch computer

Elo TouchSystems introduced the 15D1 all-in-one touch computer for use in small to medium-sized retail and hospitality businesses. Developed from the ground up for point-of-sale and point-of-service applications, the 15D1 offers a compact, modern display with a footprint that is sized to match standard cash drawers. A broad range of POS peripherals is available from Elo – including a perpendicular MSR card reader for small spaces, a hand-held bar code scanner, a fingerprint reader, and a customer facing display – to easily customize the 15D1 for customer requirements. Upgrading or adding new functionality to a 15D1 unit is quick and easy because peripherals are field-installable to minimize downtime. The Elo TouchSystems 15D1 is available with a range of input/output port connection options to allow virtually any POS configuration and it supports 3rd party peripherals such as cash drawers and printers. [http://www.tycoelectronics.com](http://www.tycoelectronics.com)

Control4 launches 7.0-inch table top touch screen

Control4 announced the introduction of the Control4 7.0-inch table top touch screen. Combining the convenience of a table top unit with an easy-to-use interface, the touch screen offers convenient control of whole-home automation, including home theater control, multi-room music, advanced temperature control, security integration, smart lighting and more. The new touch screen expands the product family, consisting of the Control4 10.5-inch portable and wall-mount touch screens, 7.0-inch portable and Power-Over-Ethernet (POE) wall mount touch screen and the mini touch screens. The new touch screen is a 16x9 format that has three times the display area of the Control4 mini touch screen and has four custom buttons for programming. This table top version makes it easy to add an additional point of navigation to any room. The screen can be placed on any countertop or nightstand enabling browsing of digital audio and movie cover art, setting lighting scenes or the management of any part of the system. Running the latest Control4® system software, version 1.7.1, the touch screen also provides a friendly interface to access online Rhapsody accounts (sold separately), while the announcement agent support allows you to view a camera’s image of someone at the door. The new touch screen can access the Control4 system over a WiFi network or via Ethernet. [http://www.control4.com](http://www.control4.com)
Black & Decker provides pre-launch demos of electronic home access control

Black & Decker provided Electronic House Expo (EHX) Spring 2009 attendees pre-launch demonstrations of its remote and wireless home access control solutions, slated for launch later this year. These electronic motorized locks – developed for interoperability with home automation and security systems – deliver a wide-range of customizable access control options. Door lock status notifications, automatic security system arming and disarming, and true remote locking and unlocking are just some of the key features that make these solutions an especially significant value-add for homeowners with security or automation systems already in place. [http://www.bdhhi.com/accesscontrol](http://www.bdhhi.com/accesscontrol)

Meridian introduces Control 10 touch screen for Sooloos

British manufacturer Meridian Audio acquired Sooloos last December. The Control 10 touch-screen interface bridges the systems together by also incorporating Meridian’s proprietary SpeakerLink/Comms Connectivity for seamless integration. The touch screen itself features a 17.0-inch screen that shows off a music collection with colorful album art. At the other end of the bridge are Meridian’s digital speakers, preamp/controllers and music systems to reproduce high-resolution digital files ripped on Sooloos’ slot-loading CD drive. There’s also RS-232 for integration into home control systems. [http://www.media.meridianaudio.com](http://www.media.meridianaudio.com)

Sony to launch touch-enabled OLED-based Walkman

Amazon UK is now accepting orders for a 16 and 32GB Sony Walkman X Series units featuring a touch-enabled interface. Price for the 32GB version is £283.00 with delivery listed as being on May 10 in the UK. Specifications include a 3.0-inch OLED at 432x240 pixels. In audio, the Sony PMP will handle MP3, WMA, AAC-LC and WAV files, while in video it will play AVC (H.264/AVC), MPEG-4 and WMV files. Other confirmed functionality includes the various equalizer settings – customs and presets – together with an FM tuner, WiFi b/g, and YouTube support. Runtime is estimated at up to 33hrs when playing music or 9hrs video playback. What remains to be seen is if the X-Series “Hybrid Operation” system will match the intuitive OS of the iPod Touch and iPhone…
HP launches a Tablet PC for home use

HP’s TouchSmart TX2 is unusual among Tablet PCs in that it’s intended for home use rather than corporate use. The panel works with both a stylus and fingers, making it easy to navigate the Vista OS. Although it’s a bright and sharp screen, image quality is lessened by the touch-screen technology, with a hazy finish that looks almost greasy. It’s at its worst when viewing small text, according to blogs. Graphics are handled by an ATi Radeon HD 3200 chip in the 12.1-inch laptop and it handles HD video and photo editing tasks. It weighs in at more than 2kg. There’s a dual-core AMD processor within the chassis, and running at 2.2GHz it helps the TX2 to run with a minimal amount of lag. The inclusion of 3072MB of memory further helps with multi-tasking, making this a competent machine in day-to-day use. There is also a 320GB hard drive in place – with top of the range models featuring a 400GB drive. The DVD rewriter features LightScribe technology, letting you burn text and images onto compatible discs. Networking features are equally comprehensive, with the latest Wi-Fi and Ethernet adapters in place, along with the inclusion of Bluetooth. http://www.hp.com

HP brings out EliteBook Tablet PC

The HP 2730p EliteBook Tablet PC is fingerprint resistant, has a built in webcam and a light to illuminate the keys. It weighs 3.74 pounds and is housed in a stainless steel case. Battery life runs from between 3 and 15 hours depending on the configuration and settings. It passes rigorous MIL-STD 810F testing for altitude, high temperatures and dust, and the HP EliteBook 2730p can operate at extreme temperatures over 60°C/140°F and below –29°C/–20°F. It includes both touch pad and point stick, combined with a scroll zone, jog dial and touch-sensitive controls. http://www.hp.com

Mitsubishi Demos 3D Touch Panel

Mitsubishi Electric recently prototyped a capacitive touch panel that can detect the distance between a finger and the panel. Mitsubishi calls the touch panel a “3D touch panel” because it can determine not only the x- and y- (plane) coordinates of a finger but also its z- (normal direction) coordinate. The prototype has a 5.7-inch screen with a resolution of 640x480 pixels. By calculating the time variation of capacity in the z-axis direction, “the acceleration of the finger approaching the panel can be detected”, a spokesperson said. With this method, the panel can determine the speed of the approaching finger. "If the backlight is designed to be red when the finger moves fast and blue when it moves slowly, emotional changes of the user can be reflected on the panel," the spokesperson said. The prototype can detect the distance of an approaching finger via the ITO electrodes. When the finger is not in contact with the panel, the capacitance change is smaller compared with when the finger is in contact with the panel, requiring high detection sensitivity. Copper electrodes would provide a sensitivity high enough to detect an approaching finger, but they are not transparent. But, if transparent electrodes are used, the sensitivity becomes lower than that with copper electrodes because the resistance value of the panel increases.

HP’s TouchSmart TX2 and 2730p EliteBook Table PC are shown on the left and center, respectively. Mitsubishi’s prototyped “3D touch panel” is shown on the right. When a finger approaches the panel, icons pop up around it.
Asus shows off dual-screen touch-enabled concept laptop

At CeBIT, Asus showed off a dual-display laptop concept. The company describes it as “a revolutionary dual-panel concept notebook,” and says the design was inspired by “ideas contributed from users from around the world.” Asus warns that “the concept is still a work-in-progress which requires continued feedback.” Asus further explains:

The dual panel offers a flexible working space in which users can adapt to suit their prevailing usage scenarios, for example adjusting the size of the virtual touch-pad and keyboard. Through hand gestures, handwriting recognition, and multi-touch, users are presented with a control surface that is both flexible and intuitive. Users can use the dual-panel concept in a myriad of usage scenarios, for example as a conventional notebook with multi-touch screens, a virtual keyboard and touch-pad; a multimedia hub, in which both dual panels could combine to form a larger display for wide-screen entertainment; or an E-book mode in which users can hold the dual panel concept notebook just like they would a conventional book while flipping pages through intuitive gestures or by touch. These concepts aim to bring convenience to the user through technological innovations and user-centric design.

Fujitsu introduces first color e-book reader

Fujitsu announced in mid-March the first commercially available color e-book reader, available in late April in Japan. The 0.84-pound device, called FLEPia, has a 260,000 color display in a 768x1024 format. Like other e-readers, the display in the FLEPia doesn’t consume power to retain an image. This gives the FLEPia up to 40 hours of battery time according to Fujitsu. There are some sacrifices for a color display, including an almost two second delay when switching from page to page in a book. The device is almost three times as expensive as the Kindle, hitting the shelves at over $1000. The device does include touch support, apparently using a resistive touch screen. Featuring significant storage capabilities, when used with a 4GB SD card, the color e-paper terminal can store the equivalent of 5,000 conventional paper-based books when each book is 300 pages long at 600KB per book, thus being environmentally friendly. In Japan, FLEPia can now be easily ordered from Fujitsu Frontech’s online store. As an additional option, through Fujitsu Frontech’s dedicated website, FLEPia users can purchase e-books from the largest e-book online retailer in Japan and download the e-books directly into FLEPia. [http://www.frontech.fujitsu.com](http://www.frontech.fujitsu.com)
Samsung Papyrus e-book reader on track for Korean launch this summer

Samsung recently announced that the Papyrus e-book reader will launch in Korea this June, after which the company will reportedly “aim” to see it released “eventually” in the US and the UK. The device is an A5-sized e-book reader (6.0-inch panel), and includes a touch-screen that makes use of an included aluminum stylus, along with 512MB of internal memory (with no memory card option), and a stylish leatherette case. The system will apparently not include any Kindle-like cellular connectivity nor any WiFi either. Samsung is reportedly looking to keep pricing below $300. The solution reportedly uses an electrophoretic front-plane from E Ink. [http://www.samsung.com](http://www.samsung.com)

AUO becomes major shareholder in SiPix

AUO announced in mid-March that it has taken a major stake in the electronic paper display market by becoming a major shareholder (over 30%) in SiPix Imaging. Early this year, Two AUO subsidiaries, Konly Venture and Ronly Venture, invested US $30 million to acquire a total of 60 million, or 31.58%, of SiPix’s shares. Other investors in SiPix include Goldman Sachs, ING Baring, Worldview, BASF, Foxconn, Toppan Forms, PTI Ventures, CMC, New Margins Ventures and Yasuda Ventures. SiPix Imaging has its roll-to-roll production facility in Chung-Li, Taiwan. SiPix has developed an electrophoretic technology, which uses a Microcup format, a microscale container holding dielectric fluid and white particles, which move when electrically charged. The contents of the microcup are hermetically sealed to protect them from the environment and the microcup structure is said to enable the thinnest and most flexible electrophoretic display. Because each microcup is individually sealed, the EPD film can be cut to any shape and size. In mid-2008, AUO started to deploy its resources to develop electrophoretic displays. This investment in SiPix will enable it to ensure its supply of EPD materials. If progress is made as planned in AUO’s development roadmap, the company expects to start EPD mass production this year and introduce flexible e-paper with a plastic substrate by 2010. [http://www.auo.com](http://www.auo.com)

Kindle 3 will reportedly have a touch-screen

Amazon’s Kindle and Kindle 2 e-readers (left and center images) failed to include a touch-capability. Reportedly the Kindle 3 (to be released later this year) will not only include touch capabilities, but a much larger screen, as pictured on the right.
Lenovo shows off Pocket Yoga netbook prototype

Lenovo is experimenting with a twist on a netbook – in this design, the display folds around so that you can write on it. Like the Sony VAIO P this concept unit has an extra wide screen leaving more room for a wider keyboard. However, vertical reading space is compromised. The concept is a couple of years old, but recently resurfaced. A representative from the Lenovo Beijing design center (http://lenovoblogs.com/designmatters/?p=1030) subsequently offered the following comments:

“Last week some buzz was created by a photograph that someone snuck out of our Beijing design studio. The picture was of a pocket-sized PC we developed about two years ago, well before the current netbook craze and the introduction of a similar form factor by one of our competitors. Since the design has been shown in public in the past and received some attention, I thought it might be of some interest to discuss the design inspiration and share some photos and drawings of the device. We in Lenovo’s Beijing design center refer to this concept as the “Pocket Yoga,” an extension of an award winning design we’ve shown in public based on a folding concept inspired by the practice of yoga by one of our New Zealand-based designers. The full Yoga concept was a folding notebook with a detachable keyboard. The system unit was covered in leather. The “Yoga” notebook experiment is finished, but the stories of new developed products from Lenovo’s design teams are always happening. Innovation never stops. Next time, which story we will share with you? Who knows?”

Immersion’s haptics technology to provide touch feedback to Pantech mobile phones

Immersion announced that Pantech signed a worldwide license agreement to use Immersion haptics technology in several of its handsets. Pantech, one of Korea’s top mobile phone manufacturers, pioneered the dual-sliding, double-keyboard handset in North America with the Pantech Duo and Matrix, and has introduced other popular products including Slate, the world’s thinnest mobile phone with a QWERTY keyboard, and the Pantech Breeze. In addition to manufacturing handsets for AT&T and other US carriers, Pantech delivers phones for network operators worldwide. Immersion’s touch feedback, in combination with sight and sound cues on mobile handsets, has been shown to improve user productivity (speed and accuracy). It also makes operation more intuitive and content more realistic and fun, improving the user experience in a number of ways: it provides unmistakable tactile confirmation in response to touch-screen or button presses; it empowers caller ID with distinctive vibrations matching a melody or song that let users know who is calling even when sound is turned off; enlivens mobile games with touch feedback similar to that found in console games; supplies pulses when scrolling over items, allowing favorites, friends, or unread e-mails to feel a bit different for easier, faster identification. http://www.immersion.com
Dell introduces Studio One 19 touch-enabled All-in-One PC to Japanese market

Dell’s new Studio One 19, starting at about $699, comes in a compact form, measuring 21.9x15.5x3.2 inches. And 18.5-inch display (at only 1366x766 pixels – a paltry 85 pixels per inch, which is one of the worst pixel densities introduced into the PC market in the past decade). Although multi-touch is offered, it is an option that adds $100 to the starting configuration price. The pre-installed software suite looks armed to take full advantage of the touch-screen: Media player apps, Internet Explorer integration, photo re-sizing, and memo taking. The rest of the machine is a series of choices: a SATA drive (160GB to 750GB), up to 4GB of RAM, CPU options from an Intel Celeron 450 processor (2.2GHz) up to a Core 2 Quad Q8200 (2.33GHz), a single slot-loading 16X DVD burner up to a Blu-ray drive (at about a $200 premium), options for a wireless keyboard and mouse (at an additional cost), and a graphics option of the GeForce 9200 or 9400. Besides the optical drive slot, you get six USB 2.0 ports, 2.1 audio out, 10/100 LAN support, and a 7-in-1 card reader. Japan retailers started selling the product in mid-March, while it isn't slated to appear in the US until “sometime this spring.” http://www.dell.com

Continuing Dell’s focus on design features, the Studio One 19 is made with aluminum, glass, and fabric that make a style statement that comes in several colors, including Solid Pure White, Tuscan Red, Navy Blue, Powder Pink and Charcoal. The display is mounted forward of the actual PC housing.

Shuttle Inc introduces all-in-one PC

Shuttle Inc, the manufacturer of small form factor (SFF) computers and accessories introduced X50, an all-in-one PC, as part of its all-new product line - Shuttle X Vision. The new X50 integrates state-of-the-art touch and small form technology, offering an intuitive interface that empowers both novices and professionals. The 15.6-inch (1366x768) all-in-one PC combines all the essential applications into a single device that starts up quickly, with a simple touch of the screen by finger or included stylus pen. Even the stand itself brings a unique touch - it is convertible, and can be flipped upward to reveal an easy carrying handle, or be completely removed for VESA ready mounting. That makes the X50 suitable for a wide variety of applications and settings, including digital signage or kiosks. The X50 measures 1.4 inches thick and features a touch-enabled screen. The built-in 1.3 megapixel webcam enables users to take pictures or stream live images across the Internet in real-time chatting. Shuttle X50 is powered by Intel’s Atom 330 dual-core processor and comes loaded with the Windows XP Home operating system. The X50 features 1GB of system memory and comes with a 160GB hard drive. http://global.shuttle.com
Motion’s J3400 rugged tablet PC boasts dual batteries and outdoor display
Motion’s new J3400 is a rugged (albeit sleek) new tablet that comes equipped with dual battery compartments and an outdoor-visible LCD. Other specs include an Intel Core 2 Duo processor, 1.8-inch shock-mounted HDD (a 64GB SSD is an option), 2-megapixel camera, GPS, a biometric sensor, multi-card reader, Bluetooth 2.1, Qualcomm’s dual-mode Gobi WWAN chip, WiFi and a chassis that is IP-52 rated and meets MIL-STD-810F specifications. http://www.motioncomputing.com

Gigabyte’s M1028 netbook/tablet goes to the FCC
Gigabyte’s M1028 has now been through the FCC process. Now sporting the “CafeBook” moniker, the netbook appears to be mostly identical to the T1028 Touch Note model that made its debut at CeBIT, which opts for a convertible tablet form. It has an 8.9-inch touch screen (as opposed to the 10-inch), but all the other specs remain the same, including Intel’s new and slightly improved N280 Atom processor, up to 2GB of RAM, a max 250GB hard drive, choice of a four-cell or six-cell batteries, and optional 3G and WiMAX. http://www.giga-byte.com

Dell updates industry-first multi-touch capable tablet
Dell announced the Latitude XT2 convertible tablet building on the industry’s first tablet PC with multi-touch screen capabilities designed to enhance security, increase performance and extend battery life. The system starts at $2,399 and is available at http://www.dell.com/latitude. Multi-touch capabilities on the Latitude XT2 allow users to use natural gestures like a pinch or tap for scrolling, panning, rotating and zooming that work with productivity applications they use every day. Dell’s integration of multi-touch screen technology allows customers to use the full real estate of the display, as opposed to just the touchpad. Other features include up to 11 hours, 28 minutes of battery life with 6-cell battery and optional 6-cell battery slice; daylight viewable display that has up to 100% more luminance than the HP EliteBook 2730p; full-size keyboard, touchpad, point stick and battery-free pen.

N-trig introduces enhanced multi-touch functionality to enterprise market
N-trig announced in collaboration with Dell, the launch of the Latitude XT2 notebook PC with an enhanced suite of multi-touch functionality. This advancement further expands the growth of “Hands-on computing” within the enterprise marketplace. The Latitude XT2 has higher optical performance and, in addition to the current multi-touch gestures – zoom, scroll and double tap — it includes rotate capabilities allowing users to turn pictures, documents and other media on the screen using natural, two-finger rotate gestures. First launched as part of the Dell Latitude XT, N-trig’s DuoSense technology enables an unparalleled experience. By providing a more natural and intuitive method for working on a PC, users can now put aside their mouse and opt to use their fingers or a stylus. Currently available on Windows XP and Vista, the Latitude XT2’s multi touch capabilities fully support Office 2007. N-trig has recently released beta drivers for Windows 7, which are available for Latitude XT2 users, enabling them to upgrade to multi-touch without having to change the hardware. Additionally, the beta drivers for Windows 7 enable ISVs to develop compatible software applications for full multi-touch. http://www.n-trig.com
Genius announces new multimedia tablet for use while traveling

Genius, a brand division of KYE Systems Corp., announced a new addition to the company’s line up of digital tablets, the G-Pen F-509, for business professionals, graphic designers and artists on-the-go. Plug and play ready, the G-Pen comes with both Windows Vista and Mac software. The G-Pen F-509 has 26 programmable “Hot-Keys” for Office, Internet and Vista functions to be used for shortcuts. The cordless pen features 1024 level pressure sensitivity and two buttons for controlling shapes and thickness. The G-Pen F-509 has a 5.25x8.75-inch working area and is easily transportable for use in a car, etc. The tablet can be used to write, draw, sketch and/or sign documents, saving time and creating a great solution to paper waste. It is perfect for those creative types who like drawing, bloggers, artists, and anyone craving a digital pen as opposed to a keyboard. The G-Pen F-509 is attractively priced at $109 (MSRP) and is bundled with PhotoImpact 12SE, Macro Key Manager and Office Ink/Free Notes. http://www.geniusnetusa.com

Axiotron incorporate Touch International’s projected capacitive touch screen into Mac tablet computers

Touch International joined forces with Axiotron Corporation, an Apple “Premier Developer” based in El Segundo, California, to integrate touch screen technology into Axiotron’s Mac-based tablet computers, the Modbook and the Modbook Pro. The Modbook was introduced to the market in December 2007. It is the world’s first Mac-based tablet computer. Axiotron’s 15.4-inch Modbook Pro is scheduled to be released in June 2009. Axiotron’s “Synergy Touch Technology”, which will be available as an option on the Modbook (beginning in April 2009) and standard on the 15.4-inch Modbook Pro, enables both pen and touch input simultaneously. The Axiotron units incorporate a projected capacitive touch screen and electronics from Touch International and the Apple computing architecture. With the Synergy Touch technology, on-screen buttons and shortcut keys give Modbook and Modbook Pro users a quick and smooth transition between tools and programs. This function meets the critical demands of creative professionals using graphic-intensive programs to create 2D, 3D, and video images. Touch International has focused its rugged, yet highly transparent, projected capacitive touch screen solutions to companies needing iPhone-type user interface with multi-touch gesturing to pinch, expand and drag images in large format display applications. The company has fielded products from 3-inch diagonal for hand-held and medical markets to 22-inch diagonal for industrial terminals, kiosks and gaming applications. http://www.touchintl.com

Samsung selects Cypress touch screen to power interface on portable media player

Cypress Semiconductor announced that Samsung Electronics has selected Cypress’s TrueTouch touch-screen solution to implement the touch-screen interface in its new P3 portable media player. With its dynamic interface and innovative design, the P3 won a CES Innovations 2009 Design and Engineering Award. The TrueTouch solution, based on the PSoC programmable system-on-chip architecture, enabled Samsung to develop customized multi-touch gestures, such as swiping a finger across the screen to switch audio tracks, or holding down a digital button to fast-forward video. Featuring a 3-inch 426x240 TFT-LCD touch screen, the P3 delivers wide-screen video and photos at a 16:9 aspect ratio without the need for letterboxing. The P3’s EmoTure interface offers true haptic feedback, reacting to every command gesture with a variety of physical sensations for a more intimate user experience versus other media players. It also features a new “Music Hot Touch Key” that allows users to instantly access favorite music features and selections without cycling through multiple menus. http://www.cypress.com/go/pr/TrueTouch
Trimble launches ruggedized Yuma

Trimble’s latest tablet borrows hardware from the netbook sector with a rugged exterior from industrial applications. The rubber-wrapped and sealed Yuma resists dust, sand, mud, humidity and extreme temperature. An ingress protection rating of 67 even means it’s protected against immersion in water up to one meter deep. Inside, an Intel Atom processor running at 1.6GHz supplies power equivalent to what you would find in a netbook, while a 32GB solid-state drive gives it resistance to shock, and integrated Bluetooth, Wi-Fi and GPS deliver connectivity. There are also dual integrated cameras for video conferencing or taking photos, as well as ExpressCard and SDIO slots for expandability. The screen spans seven inches, and the whole unit weighs 2.6 pounds with batteries. The Yuma should be available by April. [http://www.trimble.com](http://www.trimble.com)

Trimble brings out high tech agriculture GPS navigation system

Trimble has launched the AgGPS Fmx display for the agriculture market providing farmers with tools to help them better control their equipment. It has dual GPS receivers (GPS+GLONASS), which can provide up to 1 inch of accuracy, integrated radio for wireless video input and a 12.1-inch screen. It also has a light bar to give quick feedback on a route. [http://www.trimble.com](http://www.trimble.com)

Garmin brings out Nuvi GPS for truckers

Garmin launched a new GPS for truckers, the Garmin Nuvi 465T. Truckers need to know more things about the road such as lane widths, bridge heights, and load restrictions. The Nuvi 465T allows the owner to build multiple “profiles” for multiple vehicles and then create routes that obey the appropriate restrictions. This Nuvi also includes locations from the National Truck and Trailer Services Breakdown Directory for truck towing and repair needs. In addition, many more traditional navigation features are included like traffic, lane assistance, multi-destination routing with route optimization, text-to-speech, a wide-screen display, and Bluetooth. [http://www.garmin.com](http://www.garmin.com)

Sony launches GPS navigation system for Japanese market

Sony just introduced a new model for the Japanese market called Sony NV-U3C. Very similar to the other models in the Sony NV series this one also features a split screen view. However, unlike their US counterparts the Japanese model does realistic street sign view, lane assistance, and something called PetaMap data, which provides updates and sales info from restaurants and stores around. It has a 3.5-inch 320x240 screen with 4:3 ratio, 4GB of internal memory, and is available in three colors: pink, gray, and white. [http://www.sony.com](http://www.sony.com)
**Alpine PND-K3msn now shipping**

Alpine PND-K3msn has started shipping and the price is announced to be $300. It comes with three months of free subscription to the MSN Direct service, which provides traffic information, weather reports, gas prices, movie times, news and alerts, local event information and stock prices at 134 metropolitan areas in US and Canada. You also get the ‘send-to-GPS’ features and find addresses, businesses, etc. at Live Search Maps and send it directly to your device from a PC, all wireless. [http://www.alpine.com](http://www.alpine.com)

**Viliv launches S5 and X70 MIDs with video**

Viliv’s latest MIDs, the S5 and X70 use haptic feedback for on-screen keyboard input, with a resistive touch screen. They both run on Windows Vista. The X70 can be mounted to an optional leather case that brings a keyboard and foldability to the device, and turns the unit into a laptop of sorts. The S5 (pictured) features a 4.8-inch LCD at 1024x600 pixels, while the X70 uses a 7.0-inch panel, also at 1024x600 pixels [http://www.myviliv.com](http://www.myviliv.com)

**Phenom launches combined watch, phone, MP3, camera and touch screen**

Phenom Communications have managed to pair an unlocked GSM cellphone and an MP3/MP4 player and pack it inside a touch-screen equipped wristwatch. Their “Special Ops” watch seems to be their most fully-featured model and comes with a 1.3-inch TFT touch-screen display, video camera, Bluetooth, USB, MicroSD slot (up to 2GB – 256MB card included), a speakerphone and is selling for $295. [http://www.phenomwatchphone.com](http://www.phenomwatchphone.com)

A new GPS device from Alpine, a MID from Viliv, and a multi-purpose touch-enabled wristwatch from Phenom

**Apple wins patent for iPhone touch-screen controls**

Apple has won a US patent for touch-screen controls and gained a potential legal weapon against iPhone competitors. US Patent 7,479,949 is awarded to “(Steve) Jobs et al” for a method of “detecting one or more finger contacts with the touch screen display” to command computing devices. A multi-page patent available online at the US Patent and Trade Office details iPhone or iPod Touch commands such as finger or thumb swiping, twisting, or spreading to flip pages, rotate views, or enlarge images.

**Apple’s Snow Leopard adds location and multi-touch**

Apple is reportedly incorporating location and multi-touch tools for developers in Snow Leopard, features that could lead to important improvements in the usefulness of the upcoming operating system. Apple is planning to include the CoreLocation framework that had been available in the iPhone software development kit, AppleInsider reported this week. The tools would enable developers, both in and outside of Apple, to build applications that can identify the geographical location of a Mac based on its current longitude and latitude. In addition, Snow Leopard, or Mac OS X 10.6, also will contain a set of programming interfaces so developers can create applications that tap into the multi-touch features in the latest MacBooks and MacBook Pros. Apple was awarded a patent in January for the multi-touch technology used in the iPhone, giving the company more legal muscle against Palm and other rivals launching similar devices.
Ebranta puts topological map images on iPhone
TopoPointUSA is a new application for iPhone by Ebranta Technologies. Apparently it is the world’s only GPS enabled application for displaying United States Geological Survey (USGS) high-resolution topographical map images and your GPS position whether you are online or not. It costs $10. The features of TopoPointUSA are complete USGS map coverage of the USA, including Alaska and Hawaii; offline map availability when located outside cellular service; scrolling map with current GPS or browse location display; automatic offline or online operation; GPS position with accuracy and map scale information; powerful browsing capabilities with position display; fully featured waypoint capabilities. http://www.ebranta.com

Latest iPhone allows GPS navigation applications
The new iPhone 3.0 OS will let developers embed maps in applications with a public API to allow pan and zoom, custom annotations, current location, and geocoding. They enable developers to use core location as the basis of turn-by-turn directions applications. Core location gives your location with either GPS, WiFi, or cell tower triangulation. Developers can now build a turn-by-turn direction using real time location from core location. However, due to licensing Apple cannot pass on the rights to use built-in maps tiles. http://www.apple.com

Virgin plans touch-screen phone
Virgin Mobile USA plans to introduce touch-screen handsets as part of a move into “smarter” phones, the carrier’s CEO, Dan Schulman said this month. Virgin has stayed out of the smartphone market because most consumers still can’t afford such devices. Though smartphones such as the iPhone and BlackBerry get a lot of attention, they still are only about 20% of the handsets sold, he said. However, Schulman believes that figure may rise to as much as half the market over the next three to five years. http://www.virginmobileusa.com

Rubik’s Cube incorporates touch technology
Rubik’s Cube, the number one best-selling game ever, has gone “touch” with the introduction of Rubik’s TouchCube. The solution to the classic Rubik’s Cube puzzle used to be several turns away, but now it’s only several swipes away. Rubik’s TouchCube, featuring the same great game play of the Cube that has sold nearly 350 million pieces, utilizes the very latest in touch and motion technologies. Says Eric Levin, president, Techno Source, “Rubik’s TouchCube is the ‘dream cube’ for anyone who’s into high-tech gadgets – it combines today’s most current technologies with the iconic Rubik’s Cube.” Rubik’s TouchCube features touch sensor technology on all six sides, a motion-detecting accelerometer, and colored lights in every square. It even mimics the movements of the original 3x3 Cube – swipe a finger across three squares and the lights will follow, “turning” a side of the Cube; make an “L” shape to turn the top face of the Cube a quarter turn. Rubik’s TouchCube’s motion-detecting accelerometer only recognizes moves made on the top side of the Cube, so that a player’s fingers won’t move the lights on other sides when holding it. www.rubikstouchcube.com
**SoftBank selects Cypress TrueTouch touch screen for new mobile phone**

Cypress Semiconductor announced that the TrueTouch touch-screen solution from Cypress has been selected to implement the touch screen for the new Softbank Mobile Corp. 931SH mobile phone. The new phone, manufactured by Sharp Communication Systems Group offers a touch screen that delivers 1024x480 resolution, offering a brilliant, easy-to-navigate display. It also offers multi-touch capability, allowing gestures such as tap, double-tap, pan, pinch, scroll, rotate and others. The Softbank 931SH is a slider phone that offers a 3.8-inch screen, (which translates to 298 pixels per inch). It supports mobile applications such as receiving weather information and other updates on the standby screen. The new phone offers a multitude of other features, including a Wikipedia-like dictionary function and over-the-air TV reception. Cypress’s TrueTouch family, based on the PSOC programmable system-on-chip architecture, includes single-touch, multi-touch and “multi-touch all-point” offerings. The multi-touch all-point solution can track up to 10 simultaneous touches. [http://www.cypress.com](http://www.cypress.com)

**Vision Objects and Stantum introduce handwriting recognition on multi-touch user interface for mobiles**

Stantum and Vision Objects have combined their respective technologies to demonstrate a state-of-the-art solution for the mobile market. Stantum’s technology can be used by all mobile electronic devices, from the PDA and smartphone through to MP3 players, as long as they use resistive multi-touch sensors. This new technology is able to detect several finger movements simultaneously and contains a series of applications that let you maneuver several objects on the screen at the same time. In association with this technology, Vision Objects integrates MyScript, its handwriting recognition solution. Backed up by a simple, intuitive user interface, users can write a message effortlessly with either their fingertips or a stylus and see their text instantly transcribed into digital text with excellent accuracy. MyScript not only recognizes all handwriting styles but also intuitive gestures which allow users to write naturally, to insert spaces and line breaks, and to easily correct text by editing gestures (from simple backspace gestures to natural scratch outs). [http://www.stantum.com](http://www.stantum.com)  [http://www.visionobjects.com](http://www.visionobjects.com)

**VeriFone and CIC sign reseller licensing agreement**

Communication Intelligence Corporation (CIC) and VeriFone announced a reseller and marketing agreement to provide CIC’s products to VeriFone’s customers and jointly promote their product offerings. Under the terms of the agreement, CIC will provide VeriFone with its full range of biometric and electronic signature solutions targeted at the retail industry. VeriFone will promote CIC’s signature products to VeriFone’s customers and value-added resellers, enabling them to offer software solutions to address the various electronic document and transaction process needs of today’s mass merchants. CIC will also be able to leverage VeriFone’s Omni 7000 series customer activated terminals in its financial and other vertical market applications. [http://www.cic.com](http://www.cic.com)
Toshiba announces 4.1-inch touch-screen smart phone
Toshiba announced a 4.1-inch touch-screen smart phone, called the TG01. The handset looks to go head-to-head with Apple’s iPhone and HTC’s Touch HD and is the first gadget to incorporate Qualcomm’s 1GHz Snapdragon QSD2850 processor. The TG01 is slimmer than its rivals at a mere 10mm, yet features a larger 4.1-inch 800x480 touch screen, HSDPA, HSUPA, WiFi as well as built-in A-GPS navigation. The handset will also come equipped with a MicroSD card slot which is good for up to 32GB of storage, plus Flash and DIVX are supported. A custom interface hides Windows Mobile 6.1 running in the background. It features three vertical panels that can be scrolled through with a swipe of a finger. The TG01 responds to shaking and gestures and includes an accelerometer to rotate the display. Sound familiar? You can shake the smart phone to either end or answer calls, or to simply return to the home screen. The European launch date is apparently set at sometime in summer 2009. [http://www.toshiba.com](http://www.toshiba.com)

Samsung unveils “Memoir” 8 MP touch-screen camera phone
Samsung Telecommunications America (Samsung Mobile) and T-Mobile USA announced the upcoming availability of the Samsung Memoir, a full touch-screen mobile phone equipped with an 8-megapixel camera and premium multimedia features, placing it among the highest quality imaging phones available in the US. The Memoir, available exclusively from T-Mobile, is designed to look and feel like a customer's current point-and-shoot digital camera. The built-in 8-megapixel camera with Xenon flash, 16x digital zoom and five shooting modes empower customers to capture exceptional photos and videos from their phone. The touch-screen phone, enabled by Samsung's TouchWiz user interface and powered by T-Mobile’s high-speed 3G network, makes sharing photos easy. Samsung’s new photo widget allows customers to post images taken with the Memoir directly to their favorite online photo-sharing source, such as flickr, Kodak Gallery, Photobucket and Snapfish. The Memoir's full-touch virtual QWERTY keypad and multiple messaging capabilities, including text, multimedia messaging, instant messaging and e-mail, make staying connected quick and easy while on the go. The Memoir is complete with a music and video player and built-in Assisted GPS navigation, which allows customers to utilize location-based services including turn-by-turn directions. For hands-free use, the Memoir features stereo Bluetooth technology, speakerphone and voice-activated dialing. [http://T-Mobile.com](http://T-Mobile.com)

Samsung introduces “Blue Earth” - the first solar powered full-touch phone
Samsung Electronics unveiled a solar powered full-touch screen phone “Blue Earth”, alongside Samsung’s vision for environmental sustainability. Under the slogan: “The Blue Earth Dream: Eco-living with Samsung mobile”, Samsung reinforced its commitment to protect the environment through the design of eco-friendly products and a program of activities for its customers. Designed to symbolize a flat and well rounded shiny pebble, Blue Earth is the first solar powered full-touch screen phone. By charging with the solar panel located on the back of the phone, users can generate enough electronic power to call anytime anywhere. Blue Earth is made from recycled plastic called PCM, which is extracted from water bottles, helping to reduce fuel consumption and carbon emissions in the manufacturing process. The device, including charger, is free from harmful substances such as brominated flame retardants, beryllium and phthalate. [http://www.samsung.com](http://www.samsung.com)
Maple Systems announces new operator interface touch screens

Designed for applications where space is at a premium, this OIT has compact dimensions of 4x5 inches and a depth of 1.5 inches. The 4.3-inch TFT display has higher resolution (480x272 pixels) than most OITs of this size. The screen supports 256 colors, a wide viewing angle, and a high contrast ratio. The display is bright, with a rating of 300 cd/m². The HMI504T uses popup windows to display important data or keypad entry when necessary. This OIT is suited for mobile applications such as automotive or boating. The HMI504T will operate with an input voltage range of 12-24V DC. It has relatively low power consumption, only 150mA@24V DC and 250mA@12V DC. Also, there is an option to reduce the current consumption an additional 30% by dimming the display. Reducing the brightness of the display can alleviate glare during nighttime viewing.

http://www.maplesystems.com

Verizon unveils Hub touch-screen Internet phone

Verizon Wireless recently announced their new Verizon Hub touch-screen Internet phone, which aims to bridge fixed-line and wireless communications in one device. The unit will sync with your contacts, calendar, maps, weather reports and traffic info over any broadband connection, by any provider and can both send and receive SMS text messages. The Hub provides an attractive, all-in-one solution that should appeal to those looking to make the move to VOIP for their fixed-line calls. The device features a 7.0-inch touch screen for ease of use and can text message turn-by-turn driving directions and other info to any Verizon wireless handsets added to the hub. Existing home phone numbers can be ported to the hub, which will be priced at $199 after a $50 rebate. The service will only work with Verizon Wireless phones and customers must sign-up for a 2-year contract at $34.99 per month. http://www.verizonwireless.com

Asus touch solution says “Don’t Touch”

VISSUMO touch-screen withstands 9mm bullets

In VISSIMO's Test Video #99, a Ruger-wielding employee unloads a few 9mm rounds into the panel, and then proceeds to prove that the touch functionality still works.

http://www.youtube.com/watch?v=SBc5QbjDHMA&feature=player_embedded
Twenty Interviews

Volume 4 just released!

Interviews from Veritas et Visus newsletters – Volume 4

+ 2D-3D Video, Craig Summers, Founder
+ Fox Sports Network, Mike Anastassiou, Sr. Exe. Producer
+ Axis Films, Paul Carter, CEO
+ Dallas Mavericks, Dave Evans, Director of Broadcasting
+ Can Communicate, David Wooster, Head of Production
+ Ceravision, Tim Reynolds, CEO
+ Cypress Semiconductor, Darrin Vallis, Director
+ Dolby, Barath Rajagopalan, Director
+ Fusion Optix, Terry Yeo, CEO/Founder
+ LG Display, Eddie Yeo, Executive Vice President
+ Luminus Devices, John Langevin, VP of Sales/Marketing
+ MacDermid Autotype, Steven Abbott, Technical Director
+ Merck KGaA, Roman Maisch, Sr. VP of Marketing/Sales
+ Mitsubishi, David Naranjo, Director of Product Dev.
+ Nouvoyance, Candice B. Elliott, CEO
+ nVidia, Andrew Fear, Product Marketing Manager
+ Rutherford Appleton Lab, Bob Stephens, Prin. Scientist
+ SID, Tom Miller, Executive Director
+ Synaptics, John Feland, Human Interface Architect
+ Westar Display Technologies, Phil Downen, Sales Mgr

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http://www.veritasetvisus.com
OLED and Touch Screen: Emerging Display Technologies Lead Industry Growth
Jennifer Colegrove, DisplaySearch, Austin, Texas

Jennifer Colegrove first covered the OLED display market and OLED lighting. 2008 was a good year for AMOLED, she said. Shipments increased more than 200% from 2007, and revenue increased more than 100% from 2007. 2009 started strong too. What should we do in the current economy, she asked, and made three recommendations: don’t panic, keep the faith; focus on innovations (technology, applications, marketing) and make strategies about how to better compete particularly in retail, house appliances, and consumer electronics; protect your people as much as you can – you’ll need them when the economy recovers. OLED revenues will grow to $6.4 billion in 2015, up from $625 million in 2008, with CAGR of 40%. TV will become the largest revenue application, at $2.6 billion in 2015. Mobile phone main display will account for $1.9 billion in 2015. She then detailed the dozen main touch technologies and showed a touch comparison table (reproduced below). There are over 100 touch-screen suppliers worldwide currently. Touch-screen shipment will be over 765 million units in 2015. Of the current trends to watch, resistive is in price war, with some suppliers closing down. Projected capacitive shipment has more than more than tripled in a year. The optical imaging type is also expanding. Multi-touch will be in Windows 7 OS in 2H 09. Both pen and finger touch is gaining momentum. New touch-screen technology is commercializing: photo sensor in-cell, in-cell voltage, optical with waveguide, force-sensing, etc.

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The Leading Edge of Touch
Geoff Walker, Elo TouchSystems, Menlo Park, California

Another presentation from Geoff Walker is covered elsewhere in this issue. New to this presentation were some updates. 88% of the touch screens shipped in 2008 were one of the four “traditional” touch technologies: analog resistive, surface capacitive, surface acoustic wave (SAW), and scanning infrared (IR). But today there are 8+ additional new technologies competing: projected capacitive, camera-based optical; acoustic pulse recognition (APR); dispersive signal technology (DST); waveguide infrared; force sensing; digital resistive and hybrid digital-analog resistive; and LCD in-pixel sensing (“in-cell”; three different varieties). There are so many new technologies because there is a proliferation of touch. Touch is an indirect measurement and there is no perfect touch technology. There is also the drive for fundamental intellectual property, and vertical integration. The fundamental intellectual property (IP) on all four of the traditional touch technologies has expired. New patents tend to be on enhancements. Companies trying to establish a sustainable competitive advantage in touch create new technologies. Dealing with LCD in-cell touch, Walker made the point that when touch was insignificant, LCD manufacturers ignored it. Now that it’s becoming more significant (~$3B in 2008), and LCD manufacturers want to incorporate it into their products. There are three types. Firstly, optical with a phototransistor in each pixel; the downside is that it can’t sense touch on a dark on-screen object in low light. Secondly, “resistive” with contact-closure sensing in each pixel. The downside is that the user must touch the surface of the LCD (poor durability). Thirdly, capacitive with a laminated projected capacitive sensor (“on-cell”). The downside is there are the standard shortcomings of projected capacitive (e.g., no stylus).

Display-based Device Interaction
Andrew Hsu, Synaptics, Santa Clara, California

Synaptics has over 20 years experience in interface solutions with over 500 million custom solutions shipped to date. The company created the TouchPad market for laptops 15+ years ago. He explained projected capacitive sensing. It detects the presence of the human body – no physical contact is required. “Touch” is based on contact area, light touch, heavy touch. “Proximity” means before touching the surface. It is solid-state (no moving parts) and can be mounted under nonconductive materials. It has different types of elements: buttons, sliders, 2D sensors. One challenge of existing touch-only interaction is that you can’t operate a device without looking at the display. There is no inherent feedback (haptic, tactile, visual, etc.). Future directions will extending the user experience with multi-modal device awareness: grip sensing, proximity, force, haptics with touch beyond the display (gesture zone, non-deliberate touch UI interactions).

Not being able to operate a device without looking at it is inherently dangerous, and indeed in many countries illegal.
1st International Workshop on Small and Large interactive Interfaces for Data Exploration
held in conjunction with the DEXA 2009
August 31 – September 4, 2009
Linz, AUSTRIA

Call for Papers

We are pleased to announce that we are organizing the first workshop on "Small and Large Interfaces for Data Exploration" in conjunction with DEXA 2009 in Linz, Austria, 31 August - 4 September. In this workshop, we plan to explore and discuss the latest research and new paradigms of Exploring Data using alternative interface devices, including hardware and software issues.

Traditional computer interfaces and technologies provide limited support for data exploration and analysis, especially of complex data sets, under time pressure, or during collaboration. Recent developments in mobile and large, interactive surfaces introduce promising alternative computing platforms for interacting with and sharing data. The rapid advancement of wireless-enabled, mobile devices, along with multi-touch and pen-based large interactive surfaces shows that users' expectations about using these devices in their daily lives have increased. The reaction to these natural and tangible interface platforms has been dramatic and enthusiastic. This reaction demonstrates people's inherent interest in a simpler way of navigating complex information and content in which the computer interface is not a barrier, but enables them to accomplish tasks more quickly and easily. Since information systems and database systems have always been a central topic of computer science it is interesting and challenging to determine how to design and implement intuitive and interactive database interfaces on these new computing platforms.

The goal of this workshop is to bring researchers and developers together to share knowledge and expertise, to discuss all topics relevant to creating large and small interfaces to access complex data in an easy and intuitive way, and to evaluate these new kinds of interfaces while browsing and sharing data.

The workshop will have interdisciplinary appeal. We expect participation by scientists working in all areas covered by the conference, as well as those from other several disciplines (e.g. interface engineering, ubiquitous computing, pervasive computing, human-computer interaction, mobile computing, computer science, artificial intelligence, cognitive science, information visualization). We intend to take advantage of the disciplinary diversity at the workshop to begin a dialog and set the stage for future cooperation.

http://mi-lab.org/slide09
Virtual Reality Software and Technology Conference
October 27-29, 2008, Bordeaux, France

Phillip Hill covers this VRST symposium organized by ACM with presentations from McGill University/Grenoble University, University of South Australia, Immersion SAS, Vienna University of Technology, Haption/ENS Cachan, Bauhaus-Universität/Osaka University, Centre Européen de Réalité Virtuelle, Fraunhofer Institut für Graphische Datenverarbeitung, Vienna University of Technology, and Ryukoku University/Chukyo TV Broadcasting

Multi-touch Gestural Interaction in X3D using Hidden Markov Models
Sabine Webel, Jens Keil, and Michael Zoellner,
Fraunhofer Institut für Graphische Datenverarbeitung, Darmstadt, Germany

Multi-touch interaction on tabletop displays is a very active field of today’s HCI research. However, most publications still focus on tracking techniques or develop gesture configurations for a specific application setup using a small set of simple gestures. In this work they present a new approach to easily set up the recognition of even complex gestures for multi-touch applications. The gesture recognition module is based on Hidden Markov Models, which offer a robust recognition of multiple gestures in real-time. An X3D interface of the recognition module is provided to qualify designers and other non-programmers to apply gesture recognition functionalities to multi-touch applications in an easy and straightforward manner. The researchers have implemented the presented HMM-based approach for multi-touch gesture recognition for X3D environments within the context of the “instantReality” framework [Behr et al. 2007]. Two new nodes have been introduced, which provide a simple and clear defined interface that even qualifies non-programmers to access the gesture recognition module within an X3D scene. To demonstrate the functionality they created an X3D painting application. The user or multiple users, can paint on a canvas and if the resulting gesture shape is recognized, the drawn shape is smoothed. This application is tested on a computer’s desktop and on a multi-touch table as well. Recognition rates of about 93% with mouse input and 97.5% for multi-touch table input were achieved; all training data was collected on the touch table. They expect the recognition rates to be further improved by training the gesture models with data collected using various devices.

Painting application in X3D: recognized paintings created with gestural input were redefined
HandNavigator: Hands-on Interaction for Desktop Virtual Reality
Paul G. Kry, McGill University, Montreal, Quebec
Adeline Pihuit, Adrien Bernhardt, and Marie-Paule Cani, Grenoble University, France

This paper presents a novel interaction system, aimed at hands-on manipulation of digital models through natural hand gestures. The system is composed of a new physical interaction device coupled with a simulated compliant virtual hand model. The physical interface consists of a SpaceNavigator, augmented with pressure sensors to detect directional forces applied by the user’s fingertips. This information controls the position, orientation, and posture of the virtual hand in the same way that the SpaceNavigator uses measured forces to animate a virtual frame. In this manner, user control does not involve fatigue due to reaching gestures or holding a desired hand shape. During contact, the user has a realistic visual feedback in the form of plausible interactions between the virtual hand and its environment. The device is well suited to any situation where hand gesture, contact, or manipulation tasks need to be performed virtually.

Instead of capturing the position and posture of the user’s hand, the device captures the multidirectional pressure exerted by the user’s palm and fingertips. Pressure measurements are used to control the action of a virtual hand in the same indirect yet intuitive way that a SpaceNavigator controls the position of a virtual frame. The researchers therefore call their new device a HandNavigator. The work brings several important contributions:

- The HandNavigator allows users to control large displacements and arbitrary postures of virtual hands in a desktop setting, using small, natural motions of their own hands.
- The device is easy to use: much like grasping a mouse, there is no setup time for markers, nothing to wear, and passive haptic feedback cues are present.
- It reduces fatigue compared to data gloves: users are not required to hold their arm nor to maintain hand postures in the air; if they do not apply any force, the virtual hand will just maintain its posture. So users can even remove their hand from the device anytime to perform a real-world task and come back to the virtual interaction as they left it.
- The system can be used to perform a variety of tasks in virtual environments, such as gesturing, touching, and manipulating rigid or deformable bodies. Interaction with virtual objects results in plausible animation of the virtual hand since its configuration not only depends on the desired gesture but also on contact with the environment.
- The HandNavigator is inexpensive to build compared to data gloves and other motion capture systems.

The remainder of this paper explains the issues and choices made in the design of the new device.
Digital Foam Interaction Techniques for 3D Modeling
Ross T. Smith, Bruce H. Thomas, and Wayne Piekarski, University of South Australia, Australia

Digital Foam is a new input sensor developed to support clay like sculpting and modeling operations. We present techniques facilitating navigation and manipulation operations performed using Spherical Digital Foam as a sole input device. This free-form sculpting technique allows manipulation of new and existing 3D models using accumulated sculpting like motions. Digital Foam’s multi-point pressure sensitive surface captures the separate locations of a user’s fingertips allowing controlled manipulation of multiple model vertices simultaneously. Additionally, the researchers developed a technique that allows the camera view and zoom to be controlled by applying varying pressure to the Digital Foam surface. Furthermore, they have designed a menu system tailored for operation using Spherical Digital Foam as a sole input device using both the internal orientation sensor and the pressure sensitive surface. A new higher-resolution Spherical Digital Foam input device with 162 unique pressure sensors is presented. This is a significant improvement in comparison to the previous Spherical Digital Foam version with only 21 sensors. The paper discusses the design issues and how an increased resolution affects the operation and design of the algorithms used. It proposes a new dynamic button allocation technique made possible using the new high-resolution Spherical Digital Foam.

CubTile: a Multi-Touch Cubic Interface
Jean-Baptiste de la Rivière, Cédric Kervégant, Emmanuel Orvain, and Nicolas Dittlo, Immersion SAS, Bordeaux, France

Multi-touch tactile interfaces offer many advantages but their use as 3D application interfaces are rather limited, since they offer large horizontal flat projection surfaces that are not suited to many kinds of 3D operations. On the other hand, no single interface has proven to tackle the numerous specificities related to the 3D interaction constraints. Through the CubTile device proposal, this preliminary work tries to bring the strengths related to multi-touch tactile surfaces into a device aimed at 3D interactions. Consisting in a medium-sized cube where five out of six sides are multi-touch, this prototype senses several fingers, offers interaction redundancy and lets a user handle 3D manipulation thanks to single handed and bimanual input.

Since the six sides define a 3D volume in the physical space, we should be able to use the cube volume as a starting point for 3D interaction techniques. Relying on common multi-touch gestures and the combination of different sides, the researchers propose the following vocabulary for 3D manipulation tasks:

- Translations could be performed by moving symmetrically two fingers each on opposite sides of the cube.
- Scale could be performed by connecting or disconnecting two fingers.
Rotations could be performed either by: rotating symmetrically several fingers each set on opposite sides of the cube; translating asymmetrically two fingers each on opposite sides of the cube.

This proposal takes away the projection component, and wraps the multi-touch surface around a volume defined by five tactile surfaces. That way, users are able to perform basic 2D gestures on several surfaces simultaneously, the combination of which corresponds to a 3D gesture that is mapped to a 3D interaction task. With the CubTile interface, they are able to detect and analyze single handed and bimanual gestures that would mimic the everyday manipulation of real objects, with the added flexibility of applying input to a generic tactile surface that is not tied to a specific object shape. Given the early development stage of the CubTile, the next steps involve the enhancement of both the device itself and the interaction techniques. They believe these experiments to be a first move towards an innovative multi-touch 3D interface.

A Rigid-Body Target Design Methodology for Optical Pose-Tracking Systems

The standard method for estimating the rigid-body motion of arbitrary interaction devices with an infrared-optical tracking system involves attaching pre-defined geometric constellations of retroreflective or light-emitting markers, commonly referred to as “targets”, to all tracked objects. Optical markers of the same type are typically indistinguishable from each other, requiring the tracking system to establish their identities through known spatial relationships. Consequently, the specific geometric arrangement of markers across multiple targets has a considerable impact on the system’s overall performance and robustness. In this paper, the researchers propose a simple new methodology for constructing optically tracked rigid-body targets. The practically oriented approach employs an optimization heuristic to compute near-optimal marker arrangements. Using prefabricated mounting fixtures, the assembly step requires only basic hobbyist tools and skills.

Optical motion-tracking technologies are generally appreciated for their ability to cover room-sized working volumes while delivering measurements with a relatively high spatial accuracy, typically in the sub-millimeter range. A prominent subset of existing commercial and non-commercial optical tracking systems require objects to be instrumented with geometric arrangements of (three or more) optical markers before they can be tracked. Such rigid constellations of optical markers are customarily referred to as “targets” (an example of which is shown in the figure). Commonly used optical markers include light-emitting diodes (“active markers”) and small plastic spheres with a retro-reflective coating (“passive markers”). Markers of the same type are typically indistinguishable to the tracking system, hence requiring a model-fitting algorithm to establish their identities through known spatial relationships within a target.
Unfortunately, commercial manufacturers tend to refrain from publicly disclosing their design procedures. As a result, end users who are unwilling or unable to purchase pre-assembled rigid-body targets from commercial vendors are forced to rely on a mixture of intuition and experience when building their customized targets. In the remainder of this paper, the researchers propose a new practically oriented approach for constructing optically tracked rigid-body targets. It provides the blueprint of a plastic base fixture that can be used to arrange multiple markers in a wide range of geometric patterns using only hobbyist tools and skills. A configurable heuristic optimization algorithm is used to calculate near-optimal marker arrangements for different use-cases and numbers of targets, taking into account problem-specific constraints such as occlusions and the shape of the instrumented interaction device.

**Haptic Simulations Based On Non-Smooth Dynamics For Rigid-Bodies**

Loic Tching, Haption/IRISA-Bunraku, Rennes, France  
Georges Dumont, ENS Cachan/IRISA-Bunraku, Cachan, France

In the context of virtual reality, haptic interfaces are coupled with simulations, which treat interactions between objects. To simulate contacts or impacts, the researchers focus their attention on simulators based on dynamics for rigid models. In this article, they first propose a brief state of the art on closed-loop haptic interaction. Then, they discuss the use of non-smooth dynamics methods for interactive, haptic-based simulations. They finally present their research software, which proposes a haptic interface coupled with non-smooth dynamics algorithms.

In haptic simulation, the use of the penalized model, for example, leads to stable interface-simulation coupling. But the mechanical validity of such approaches is less rigorous that the non-smooth contact dynamics approaches that the researchers propose to use. They have based their work on this method to propose a haptic simulation. The prototype that they have developed is based on the time-stepping approach of non-smooth dynamics. It proposes an interactive simulation of rigid-bodies with unilateral treatment of collision and haptic feedback for the user. The first results on basic 3DOF virtual objects are greatly encouraging. They demonstrate that the NSCD method, originally fitted for granular environments, could provide pertinent results for haptic simulation.

There are several directions for future work. The first will be the evaluation of the model regarding haptic rendering and compare it with penalized models. The second work will be the integration more complex virtual objects. Indeed, within the industrial framework, the applications of haptic interfaces consist, in general, in combining assemblies/disassemblies (A/D) operations. Thanks to a more generic collision detector, as one of the existing library (VCOLLIDE for example), they would like to evaluate the haptic rendering of CAD models. The industrial needs on task performing are one of main motivation of the work.

*Two examples of haptic simulation. On the left, a haptic held sphere strikes a 22 blocks wall. On the right, a haptic held sphere shakes 50 spheres in a bowl.*
Gesture Recognition In Flow based on PCA and using Multi-agent System
Ronan Billon, Alexis Nédélec, and Jacques Tisseau, CERV (Centre Européen de Réalité Virtuelle), Brest, France

In the context of virtual theater, a virtual actor performs with a real actor. They communicate through movements and choreography. The system has to interpret the real actor’s gesture into a symbolic representation. Therefore, the researchers present a method for real-time recognition. They use properties from principal component analysis (PCA) to create signatures for each gesture and a multi-agent system to perform the recognition.

Their aim is to put on a short play featuring a real actor and a virtual actor, who communicate through movements and choreography with mutual synchronization. Although the theatrical context is a good ground for multimodal communication between human and virtual actors, this paper deals with the ability to perceive the gestures of a real actor. During the performance, the goal is to match real-time observation with recorded examples. The recognition event is sent to a virtual actor, which replies with its own movements. They made the assumption that the first phase is to summarize the variation of the movement into a symbolic description. Then, the recognition phase is performed when a new trajectory is consistent with this description. The main section describes the method of creating a signature from gestural data and the recognition system in real-time flow.

Mutual Occlusions on Table-top Displays in Mixed Reality Applications
Daniel Kurz, Bauhaus-Universität, Weimar, Germany
Kiyoshi Kiyokawa, and Haruo Takemura, Osaka University, Osaka, Japan

This paper describes an approach to dealing with mutual occlusions between virtual and real objects on a table-top display. Display tables use stereoscopy to make virtual content appear to exist in three dimensions on or above a table top. The actual image, however, lies on the physical plane of the display table. Any real physical object introduced above this plane therefore obstructs our view of the display surface and disrupts the illusion of the virtual scene. The occlusions result between real objects and the display surface, not between real objects and virtual objects. For the same reason virtual objects cannot occlude real ones. Our approach uses an additional projector located near the user’s head to project those parts of virtual objects that should occlude real ones directly onto the real objects. The researchers describe possible applications and limitations of the approach and its current implementation. Despite its limitations, they believe that the proposed approach can significantly improve interaction quality and performance for mixed reality scenarios.

The prototypical display setup is illustrated in Figure 1. The tabletop display consists of a back-projection screen that is illuminated by two video projectors (7,8) located in the base of the unit running at 60Hz. A mirror (5) reflects the projection to reduce the size of the installation. LC shutters (6) are mounted in front of the projectors and shutter them at 120Hz to support active stereo. Note that passive stereo is not viable here since we are projecting onto real objects that do not preserve polarization. The top-projector (1) is mounted above the user’s head on a wooden frame fixed to the table-top display. They use an InFocus DepthQ 3D video projector that natively supports active stereo at 120Hz. It is mounted so that it projects onto the table-top surface from above. They decided to mount it as high as possible to maximize the projection size and resulting interaction space.

Figure 1: Proposed display setup; active stereo is illustrated using color coding (red/green)
The user wears shutter glasses (3) that shutter the eyes alternately in sync with the shutters of both the table-top display and the top projection. This leads to proper separation of the stereo image pairs for both displays. Head tracking is necessary in order to be able to render properly. They use a Polhemus FASTRAK tracking system. A receiver (2) is attached to the shutter glasses. The emitter (4) defining the world coordinate origin is attached to the wooden frame close to the user. The whole setup is powered by a single PC. In order to drive three displays at once they use a Matrox Dualhead2GO in addition to an Nvidia Quadro FX 3450 graphics card.

To prove that the system works they started with a very simple application. The user holds a Y-shaped wooden tool (cf. Figure 2a) which he or she can use to test for occlusions with virtual content displayed by the setup (in this case an image of a danseuse). This application can be seen in Figure 2. Figure 2(b) shows the rear projection only, which is how the application would look like on an ordinary table-top display. By adding the top-projection (c) it is clearly visible, that the danseuse is located in-between the prongs of the tool, not behind it (d). This simple application shows that the proposed system works and gives an idea of its potential.

SqueezeOrb: A Low-Cost Pressure-Sensitive User Input Device
Thomas Pintaric, Thomas Kment, and Wolfgang Spreicer, Vienna University of Technology, Vienna, Austria

This paper introduces a new low-cost pressure-sensitive user input device called “SqueezeOrb”. The device is built from an assembly force-sensing resistors embedded in an elastic hand exerciser. A USB-enabled microcontroller continuously samples the sensors, applies a double-exponential noise-reduction filter and streams the resulting “handgrip strength” measurement to an attached host computer at a frequency of up to 1000Hz. When combined with optical motion-tracking, the SqueezeOrb becomes a pressure-sensing input device for three-dimensional interaction. The researchers are currently developing several game prototypes for VR assisted upper-limb rehabilitation, in which the SqueezeOrb will be used for handgrip strength measurement. They also plan to investigate the broader topic of three-dimensional interaction techniques based on pressure-sensitive user input from a tracked SqueezeOrb. However, these applications are beyond the scope of this paper.
An Attempt of Real-time CG Control with Multi-touch Devices
Asako Soga, and Masahito Shiba, Ryukoku University, Kyoto, Japan
Tetsuya Kawamoto, Chukyo TV Broadcasting, Nagoya, Japan

The researchers have been developing real-time CG control systems with Lemurs, which are multi-touch devices. They have developed two prototype systems that control CG objects and animation and a practical system that supports creating of TV content. The system, which provides an easy and intuitive way to control two or more parameters simultaneously, allows users to control such complicated data as real-time CG contents. They verified that the system can be used in actual broadcasting.

Real-time CG control has recently become common in entertainment, especially in games. Such devices as game pads and keyboards control many parameters at the same time. However, with such devices, it is difficult to handle complicated tasks and control continuous values. In addition, easy and quick operations are required for real-time interactions. In this research they have developed a real-time CG control system with a Lemur (JazzMutant), which is a multi-touch device. The proposed system has the following features: two or more parameters of CG objects can be intuitively controlled at the same time, and user interface can be freely designed. With these features, the system can be used for complicated applications. Their goal is to develop such useful tools as creation-support systems for TV programs and art performances.

Figure 1 shows the structure of our proposed system that consists of the following components: Lemurs are multi-touch devices whose interfaces can be configured dynamically; Lemur manager is a server that provides applications with functions to use Lemurs; and applications that are software for controlling CG contents with multi-touch interfaces.

Figure 2 is a recording scene of a TV program and a snapshot of the system that displays the undulation of the green and the animation of the golf ball. The system gets live images of a miniature golf green from a camera. A virtual player and a virtual ball are put on the images by Augmented Reality markers. The ball trail from the player to the cup is displayed on the image. The yellow arrows show the undulation of the green. The trail of the golf ball can be controlled by MultiSlider, which is a user interface object that outputs many one-dimensional continuous values. The undulation of the green is also changed by Faders. This system was used in an actual TV program.
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SID Mobile Displays Conference 2008
September 23-24, 2008, San Diego, California

Phillip Hill covers the touch aspects of this conference with presentations from Toshiba America Electronic Components, Elo TouchSystems, Stantum, and RPO

TMD and TAEC Strategy in Mobile Displays
Hiroshi Maeda, Toshiba America Electronic Components (TAEC), Irvine, California

Maeda gave an overview of Toshiba Matsushita Display and TAEC’s mobile display business strategy and its core technologies and differentiation. FSID technology uses two image capture modes that are used in different environments. FSID captures finger reflection from the backlight in darker environments and captures finger shadow in brighter environments. FSID chooses the most suitable mode automatically (see illustration). Through image processing of both the grayscale picture and an edge-enhanced picture, both touched-area-detection and touch-timing-detection are accomplished in the image processing LSI (in other words the sensor ASIC).

Touch Screens and the Mobile Phone Market
Geoff Walker, Elo TouchSystems, Menlo Park, California

Multimedia and data services usage but ease of navigation and text entry remained unchanged until a disruptive change happened – the Apple iPhone. Walker said: “It’s not just touch, it’s not just multi-touch, it’s not even really about touch. Touch is just an enabler.” What did touch enable on the iPhone? A user interface that provides such incredibly intuitive access to a relatively complex set of functions that even a 7-year-old can use it without training or assistance. Apple changed the way people think about touch. Touch went from something that you poke at in an
airport check-in line to an enabler of a whole new way of interacting with devices. It’s all about the user experience, not the technology, Walker said. He went on to list many different assumptions about the touch market:

- Smartphone demand and growth rate
- Expansion of touch into the “feature-rich” segment
- Touch becoming a standard feature on mobile phones
- Adoption rate for projected capacitive (the “iPhone effect”) 
- The emergence of touch-optimized software
- The importance of handwriting recognition in Asia
- Emerging display technologies that defocus touch
- Competing input technologies such as voice
- The value of haptics in overcoming resistance to touch
- Convergence with other consumer devices
- The degree to which touch becomes ubiquitous.

He identified the ideal touch technology for a mobile phone: stylus and finger usage; multi-touch; high durability; high transparency and clarity; completely flush top surface; low power consumption; stable calibration; narrow borders; substrate independence; and low cost. He showed a table (see Touch Panel, January 2009, p73) to indicate that there is no perfect touch solution. He also showed a table (shown here) comparing the mainstream technologies that illustrates the same thing.

<table>
<thead>
<tr>
<th>Touch Object</th>
<th>Analog Resistive</th>
<th>Projected Capacitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stylus &amp; finger</td>
<td>Finger-only</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Poor (plastic)</td>
<td>Excellent (glass)</td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>Very good</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Very low</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Very low</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

He showed a slide that assesses the current gap between smartphones and expectations of a mobile computer (see illustration). Emerging needs in smartphones are responsiveness; fast and natural writing technique; means to edit documents in an efficient way; means to move quickly from one application to the other; and means to prevent unwanted gestures. Barriers are too many features, not enough space, limitation of traditional WIMP user interfaces, and limitation of gesture-based interface. He went on to look at various interaction techniques: single touch stylus writing; two touch to scroll; two touch to zoom, etc. Main operations are performed with the dominant hand with subsidiary operations performed with the thumb of the handling hand.
Digital Waveguide Touch: a New Approach to Optical Touch Panels for Mobile Devices
Kevin O’Reilly, RPO, San Jose, California

O’Reilly highlighted the mobile touch issues of today. All current technologies require ITO overlays. If the display is highly reflective, there is a reduction in display clarity in outdoor/sunlight; if the display is highly absorptive, there is reduced screen brightness and reduced battery life. Issues with resistive touch are durability and the need for high-pressure touch. Issues with projected capacitive touch are that it does not respond to pen or gloved finger, it is very low resolution, and is high cost.

Digital Waveguide Touch (DWT) is a patented touch technology that can do single, double, and multi touch. It can respond to any input device – pen, finger, glove, and all objects, and can identify the input device. It has no ITO coated overlays and has best in class transmission. It is a true “zero-pressure” touch technology, simple, has few components, and is inherently more durable. He went on to explain how it works with polymer optical waveguides. RPO is currently engaged with multiple display suppliers to the mobile industry, multiple automotive electronics suppliers, and multiple device OEMs. Multiple reference designs available, and the company is sampling single and double touch evaluation kits.

Current 3.5-inch evaluation kit configuration

User Interface Software and Technology (UIST)  
October 19-22, 2008, Monterey, California

Phillip Hill reports on this conference with presentations from University Paris-Sud, University of Waterloo/University of North Carolina at Charlotte, Newcastle University, Stanford University, University of California/Microsoft Research, and University of Michigan

The ProD Framework for Proactive Displays  
Ben Congleton, Mark S. Ackerman, and Mark W. Newman, University of Michigan, Ann Arbor, Michigan

A proactive display is an application that selects content to display based on the set of users who have been detected nearby. It is the researchers’ view that promising patterns for proactive display applications have been discovered, and now we face the need for frameworks to support the range of applications that are possible in this design space. In this paper, they present the Proactive Display (ProD) Framework, which allows for the easy construction of proactive display applications. It allows a range of proactive display applications, including ones already in the literature. ProD also enlarges the design space of proactive display systems by allowing a variety of new applications that incorporate different views of social life and community. The researchers have implemented a number of new applications. One such application is the Cohesion Collage (see photo). The Cohesion Collage selects content for display that matches the intersection of interests among all members currently in front of the display. Thus, the Cohesion Collage allows users to suggest data sources and interests (implemented in the form of tags and query terms) that match their preferences. The specific content items selected for display are then generated by the overlap in group members’ interests. While the current implementation of the Cohesion Collage uses a simplistic technique for finding the intersection of interests – simply selecting the tags and data sources that occur most commonly among the set of collocated community members – the researchers envision that greater sophistication in the identification of both shared interests and opportunities for fostering cohesion could lead to improved experiences for community members. For example, by taking advantage of information about the community social network, intersections among collocated community members with the weakest ties (or the strongest, if so desired) could be weighted more heavily. The development of the ProD framework has introduced a number of interesting avenues for future exploration. One is the potential to evaluate the effects of different ProD public displays. By observing the types of social interactions and user reactions that are engendered by different approaches to presence governance, content nomination, collaborative selection, and presentation, we can begin to understand the potential of proactive displays to impact social interactions among people who share a physical space. Furthermore, proactive displays, partially because of their relative simplicity, turn out to be very useful test beds for looking at a number of important HCI problems – collaborative rules and preference setting being two.
OctoPocus: A Dynamic Guide for Learning Gesture-Based Command Sets

Olivier Bau, and Wendy E. Mackay, University Paris-Sud, Orsay, France

The paper describes OctoPocus, an example of a dynamic guide that combines on-screen feedforward and feedback to help users learn, execute and remember gesture sets. OctoPocus can be applied to a wide range of single-stroke gestures and recognition algorithms and helps users progress smoothly from novice to expert performance. The researchers provide an analysis of the design space and describe the results of two experiments that show that OctoPocus is significantly faster and improves learning of arbitrary gestures, compared to conventional Help menus. It can also be adapted to a mark-based gesture set, significantly improving input time compared to a two-level, four-item Hierarchical Marking menu.

Like Marking menus, OctoPocus appears after a “press and wait gesture” of approximately 250ms. However, for OctoPocus, both feedforward and feedback are continuously updated as the gesture progresses. Novice users may display a map of all possible gestures and commands, centered around the current cursor position, to help them learn the associations between gestures and commands. After the user selects and begins to make a gesture, less likely gesture guide paths become thinner and disappear. OctoPocus reveals each gesture’s ideal future path as well as how the current gesture has been interpreted by the recognizer. Because OctoPocus appears only if the user hesitates, experts can execute commands very efficiently, but can slow down at any time to see which gestures and commands remain. Figure 1 shows how OctoPocus appears to a novice user who is learning gestures associated with copy, cut and paste. As the user begins to follow the copy guide path, the paste path quickly disappears and the cut path becomes progressively thinner, indicating that it is less likely to be recognized. If the user returns to the starting point of the gesture without releasing the mouse button, OctoPocus resets itself.

The researchers created a difficult 16-item gesture-command set. OctoPocus was available for eight gestures and a traditional Help menu was available for eight other gestures. Figure 2 shows the two guides at the first moment of novice mode. They randomly linked gestures to city names and verified that there were no obvious relations between them, e.g., a round shape for Oslo.
Kinematic Templates: End-User Tools for Content-Relative Cursor Manipulations
Richard Fung, Edward Lank, and Michael Terry, University of Waterloo, Waterloo, Ontario
Celine Latulipe, University of North Carolina at Charlotte, Charlotte, North Carolina

This paper introduces kinematic templates, an end-user tool for defining content-specific motor space manipulations in the context of editing 2D visual compositions. As an example, a user can choose the “sandpaper” template to define areas within a drawing where cursor movement should slow down. The current implementation provides templates that amplify or dampen the cursor’s speed, attenuate jitter in a user’s movement, guide movement along paths, and add forces to the cursor. Multiple kinematic templates can be defined within a document, with overlapping templates resulting in a form of function composition. A template’s strength can also be varied, enabling one to improve one’s strokes without losing the human element. Since kinematic templates guide movements, rather than strictly prescribe them, they constitute a visual composition aid that lies between unaided freehand drawing and rigid drawing aids such as snapping guides, masks, and perfect geometric primitives.

Kinematic templates define a class of drawing aids that influence cursor movements without rigidly prescribing them (see figure). These aids can thus be considered a form of soft constraint that actively affects one’s output without losing the human element. As such, kinematic templates occupy a space between unaided freehand drawing and the rigidly defined output achieved through drawing aids such as guides, masks, geometric primitives, and snapping constraints.

Compared to existing techniques, kinematic templates target a space between unaided freehand drawing and drawing aids that strictly prescribe output. Notably, its capabilities allow users to improve the quality of individual strokes, without completely removing the qualities of freehand human input, which is desirable in some styles of visual composition. A number of open research possibilities exist. First, it would be useful to explore additional ways to use the semantic information provided by user-defined kinematic templates. They have explored one possibility via the automatic zooming associated with use of the sandpaper template. Second, there is an opportunity to investigate additional ways to automatically generate templates from existing compositions to support tasks such as tracing an image. Third, opportunities exist to explore how these tools might assist users when learning how to draw (for example, an instructor creating templates in advance to aid students in drawing a scene in a picture). Finally, it would be useful to understand how they might aid those with motor disabilities.

Attribute Gates
Ahmed N. Sulaiman, and Patrick Olivier, Newcastle University, Newcastle upon Tyne, England

Attribute gates are a new user interface element designed to address the problem of concurrently setting attributes and moving objects between territories on a digital tabletop. Motivated by the notion of task levels in activity theory, and crossing interfaces, attribute gates allow users to operationalize multiple subtasks in one smooth movement. The researchers present two configurations of attribute gates; (1) grid gates which spatially distribute attribute values in a regular grid, and require users to draw trajectories through the attributes; (2) polar gates which distribute attribute values on segments of concentric rings, and require users to align segments when setting...
attribute combinations. The layout of both configurations was optimized based on targeting and steering laws derived from Fitts’ Law. A study compared the use of attribute gates with traditional contextual menus. Users of attribute gates demonstrated both increased performance and higher mutual awareness. Attribute gates are motivated by the need for a fluid way to change a number of different settings when moving objects between territories on the table. The collaborative nature of digital tabletops requires components to promote the mutual awareness of users. This is a particular concern for multi-user environments, yet is often ignored in the application of desktop interface components to tabletops. The design of attribute gates is based on both the principle of task levels from activity theory, and the notion of crossing-based interfaces. Moreover, the spatial configuration of attribute gates can be optimized through the application of targeting and steering laws derived from Fitts’ law and consideration of the large horizontal surface of a digital tabletop.

Tapping and Rubbing: Exploring New Dimensions of Tactile Feedback with Voice Coil Motors
Kevin A. Li, William G. Griswold, and James D. Hollan, University of California, San Diego, California
Patrick Baudisch, Microsoft Research, Redmond, Washington

Tactile feedback allows devices to communicate with users when visual and auditory feedback are inappropriate. Unfortunately, current vibrotactile feedback is abstract and not related to the content of the message. This often clashes with the nature of the message, for example, when sending a comforting message. The researchers propose addressing this by extending the repertoire of haptic notifications. By moving an actuator perpendicular to the user’s skin, the prototype device can tap the user. Moving the actuator parallel to the user’s skin induces rubbing. Unlike traditional vibrotactile feedback, tapping and rubbing convey a distinct emotional message, similar to those induced by human-human touch. To enable these techniques they built a device they call soundTouch. It translates audio wave files into lateral motion using a voice coil motor found in computer hard drives. SoundTouch can produce motion from below 1Hz to above 10kHz with high precision and fidelity. They found that participants were able to distinguish a range of taps and rubs. The findings also indicate that tapping and rubbing are perceived as being similar to touch interactions exchanged by humans. These techniques are the result of an exploration into low frequency feedback using the soundTouch device, which uses voice coil motors to generate tactile feedback. It made two contributions. First, two new naturalistic tactile feedback techniques, tapping and rubbing, using the soundTouch technology. Second, exploratory user studies of these two techniques demonstrated both that users perceive them as the taps and rubs encountered in daily experience, and that they provide a large range of distinguishable cues. Future work will explore mobile implementations of the tapping and rubbing interfaces, applications to exploit these cues, and design of haptic icons for the mobile application space. One particular interest in this space concerns the prelearned semantics of tapping and rubbing, and how they could productively guide haptic icon design. Another promising idea is to use multiple tapping actuators to generate perceptually different icons.
Iterative Design and Evaluation of an Event Architecture for Pen-and-Paper Interfaces
Ron B. Yeh, Andreas Paepcke, and Scott R. Klemmer, Stanford University, Stanford, California

This paper explores architectural support for interfaces combining pen, paper, and PC. It shows how the event-based approach common to GUIs can apply to augmented paper, and describe additions to address paper’s distinguishing characteristics. To understand the developer experience of this architecture, the researchers deployed the toolkit to 17 student teams for six weeks. Analysis of the developers' code provided insight into the appropriateness of events for paper UIs. The usage patterns they distilled informed a second iteration of the toolkit, which introduces techniques for integrating interactive and batched input handling, coordinating interactions across devices, and debugging paper applications. The study also revealed that programmers created gesture handlers by composing simple ink measurements. This desire for informal interactions inspired us to include abstractions for recognition. This work has implications beyond paper – designers of graphical tools can examine API usage to inform iterative toolkit development.

Through the deployment, evaluation, and improvement of the toolkit, the researchers have learned that an event-driven approach provides a solid platform for building paper applications. Added support for multi-device communication, unifying batched and real-time event handling, ink processing, and rapid debugging helps to provide a low barrier for entering this space. The results can have impact on tools outside of this domain. For example, they found it valuable to combine evidence from long-term use with static analysis of source code to inform toolkit design, and thus suggest that tool designers adopt these techniques. GUI platforms can also benefit from better abstractions for integrating web services and mobile devices, as consistent with today’s trends. However, there remain opportunities for research. First, they would like to involve non-programmers (e.g., designers). One line of future work would be to provide tools to specify interactions by example. Second, since programmers frequently need to learn new libraries and toolkits, they will examine how visualizations can help developers understand program internals to speed development. Finally, in today’s paper applications, if the user needs to update his UI, he must print out a new copy. In the future, the researchers will support the scheduling of automatic updates, and treat the paper UI as a view (from MVC) with a very slow refresh rate. PaperToolkit is open-source. The code and documentation are at http://hci.stanford.edu/paper.
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http://www.veritasetvisus.com
Interview with Garrick Infanger from VISSUMO

Garrick Infanger has been the president of VISSUMO since 2007. His background is in new ventures and has served as both general manager of a $4m retail operation and VP of marketing for a $25m import start-up. He has an MBA from the University of Maryland and an undergraduate degree from Brigham Young University.

Please give us some background information about VISSUMO. What’s the linkage between VISSUMO and QSI? VISSUMO is a wholly-owned subsidiary of QSI. The company was formed to commercialize Force Panel Technology that was developed in QSI’s research labs and originally marketed under the name InfiniTouch.

Is there any special meaning behind the name VISSUMO? The name VISSUMO is derived from two Latin words: *vis* meaning force and *summa* meaning sum or total. Highly descriptive of the technology behind the products, VISSUMO panels provide true “finger touch” interaction by calculating the actual force of a human touch on a rigid panel.

Tell us about the concept of direct force measurement. The physical parameter inherent in touch (force) is not directly measured by any traditional touch screen technologies on the market. In all cases, the force of a touch is converted to some other physical parameter, which is then measured. Engineers have been trying to measure touch force as a means of determining touch location for nearly forty years but have been unsuccessful because of lateral (non-orthogonal) forces and complex signal processing requirements.

VISSUMO has solved these and other issues with a patent-pending beam structure and innovative algorithms. VISSUMO force panels can sense the x-y location of a touch by accurately and reliably measuring the force being exerted at the touch location. VISSUMO’s Force Panel Technology is the only touch technology that simply and directly measures the force of a person’s touch rather than using a complex indirect measurement.

What makes your Force Panel Technology unique? The design and implementation of current touch products are limited by the durability and reliability of touch screens. Because of technical constraints, touch screens can wear out quickly under heavy use, and are subject to scratching and damage from careless users. They cannot be used effectively in outdoor applications such as ATMs or gas pumps because they are hard to read in direct sunlight. And they simply do not work when the screen area gets blocked by rain, mud, snow, or an act of vandalism.

Unlike every other touch technology available today, VISSUMO touch panels directly measure the force of a touch on a rigid panel. Our proprietary technology then accurately computes the x and y coordinates of the touch location. This means that touch applications are no longer limited to a display screen. Now, a solid panel made of virtually any material in any size or shape can function as a touch panel.

Panels made of rigid, high-impact materials such as glass and metal will virtually never wear out no matter how many touches they sustain in high use applications such as busy traffic toll booths or 24-hour gaming and entertainment facilities. They are the ideal solution for unattended applications or outdoor environments exposed to weather conditions, bright sunlight, or possible vandalism.

The architectural design of a VISSUMO touch panel is limited only to a designer’s imagination. Panels can be made to virtually any size or shape and of any rigid material or combinations of materials. Irregular elements, surface penetrations, and additions can be included for practical or purely aesthetic effects. Beautiful designs are possible by combining natural materials such as marble, slate or granite with glass, anodized metal, plastics or eco-friendly resins and composites. If a designer can imagine it, VISSUMO’s touch technology can bring it to life.
Finally, VISSUMO force panels can help meet energy conservation and environmental specifications. Entire touch panels can be made from eco-friendly materials such as bamboo, resins, and recycled composites or incorporated into innovative information panels, kiosks and displays of all kinds. The result: stylish touch applications that are right at home in the most advanced green building projects imaginable.

**Please explain how your Force Panel Technology works?** The location and force of the user’s touch can be quickly and accurately determined by placing four force sensors (S1, S2, S3 and S4) near the corners of the touch surface. Touching the surface at the center imposes equal force on all four sensors while touching the surface at towards a corner imposes greater force on the closest sensor and the least amount on the opposite sensor. The X-Y location is easily determined by using relatively simple math equations:

\[
X = \frac{(S3 + S4)}{(S1 + S2 + S3 + S4)} \\
Y = \frac{(S1 + S3)}{(S1 + S2 + S3 + S4)}
\]

An inexpensive DSP device performs the processing necessary to analyze the four force waveforms, calculate appropriate measurement points, and generate an accurate touch location. The patented algorithms behind Force Panel Technology have been implemented on a 75x115mm controller board. The controller board can be located up to three meters from the sensors on the touch panel. The board may be powered using the USB interface or a separate supply.

**What materials can be used?** The touch panel can be made from any rigid material, including metal, plastic, glass, stone, wood, laminate, composites and the new eco-friendly materials made from reclaimed, recycled, or rapidly renewable resources. Any combinations of materials can be used for design purposes or purely aesthetic effects.

**Are there any limitations on the size of the force sensing panels?** We have constructed panels from 4 to 32 inches diagonally. Force panels can be mounted horizontally as well as vertically.

**Does the VISSUMO material need to be flat, or can it work on irregular, curved, or three-dimensional surfaces?** There are no limits to the design and physical layout of a VISSUMO touch panel. Any size or shape is possible and any combination of materials in regular or irregular shapes and surfaces can be included in the design. Touch panels can include off-screen touch areas. Buttons can be adhered or simply screen-printed. Holes and slots can be made for speakers or credit card readers.
In addition to touch-location sensing, is there a force-sensing capability as well? The ±z-axis force is easily determined with a simple equation:

\[ \text{Force (finger)} = (S1 + S2 + S3 + S4) \]

…where S1, S2, S3 and S4 are the four sensors at the corners of the force panel.

Is it sensitive enough to capture handwriting inputs? We have applications capable of signature capture.

Can VISSUMO support multi-touch applications? Not at this time.

Can VISSUMO be used where there is ambient vibration? Currently, some vibration in low frequency ranges (below 30Hz) will make VISSUMO panels report spurious “touches”. We are working to compensate for vibration.

What is the practical lifetime of a VISSUMO panel, and what determines lifetime? Because there are no components that would wear out, the useful lifetime of a VISSUMO panel is very long. We have tested our components to over 12 million presses.

In what applications do you see the optimal uses for Force Panel Technology? The unique characteristics of VISSUMO’s Force Panel Technology create new possibilities for the design and implementation of touch panels unlike any on the market today. Panels made of rigid, high-impact materials such as glass and metal will virtually never wear out no matter how many “presses” they sustain. They are the ideal solution for unattended applications or outdoor environments exposed to weather conditions or possible vandalism. Stylish information kiosks in public spaces, for example libraries, museums, and information centers, can be made of natural materials such as slate, marble, and hardwoods. They can also help meet green design specifications in energy efficient buildings by incorporating panels made of eco-friendly materials. The possibilities are limited only by the imagination.

What limitations of other touch technologies does VISSUMO eliminate? The performance characteristics of VISSUMO panels are comparable or superior to the best existing touch products. VISSUMO’s advantages include the integration of multiple materials in a single touch surface, elevated and irregular surfaces, surface attachments and penetrations in the touch surface. Their extreme durability and resistance to harsh use and vandalism make force panels superior applications for unattended and outdoor environments.

Can you offer some comparisons about the costs of the VISSUMO solution as compared to other touch implementations? Depending on volume and the application we are less expensive than infrared.

<table>
<thead>
<tr>
<th>Clarity of Display</th>
<th>VISSUMO</th>
<th>Resistive</th>
<th>Projected Capacitive</th>
<th>Infrared</th>
<th>Optical</th>
<th>Bending Wave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather Resistant</td>
<td>*****</td>
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<tr>
<td>Debris Resistant</td>
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<tr>
<td>Damage Resistant</td>
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<td>Design Flexibility</td>
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<td>Attachments</td>
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<td>Z-axis</td>
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<td>Vibration</td>
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<td>Lowest Cost</td>
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</table>
What is the biggest technical challenge that you think still deserves improvement in your technology? We get many requests for mobile applications and multi-touch capability.

Where are VISSUMO products manufactured? Our products are manufactured in our facility in Salt Lake City, Utah, one the growing technology areas in the western United States. Typically, we license our technology to our partner companies and they often build their applications with minimal parts from VISSUMO.

2009 is likely to be a tough year for the electronics market. What do you think will be a “home run” for VISSUMO for the year, given the current challenges in the market? We have a number of projects in development with partner companies at this time. If they are able to maintain their development budgets and introduce products with our technology this year we will be very happy.

What new ways are you reaching out to meet potential customers? We are focusing on a very Internet-centric marketing plan with an updated website and touch-screen blog set to launch in April. We also introduced a series of videos showcasing our technology’s incredible durability. One video shows the touch screen being shot with a gun and another shows intense vandalism. The videos, shown on YouTube and a number of engineering websites, have garnered over 30,000 views in the past two months.

Typical applications for VISSUMO’s Force Panel Technology include kiosks and control panels and other high-use solutions that require durability and resistance to difficult environments.

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See you in San Antonio!
Windows 7 touch implementation

by Dave Bhattacharjee

Dave Bhattacharjee is a director and part owner of Touch-Base Ltd and has been involved with the development of touch-related software for the last 20 years. Prior to forming Touch-Base he worked as a senior consultant for American Express Bank and was involved in the computerization and modernization of the dealing room utilizing innovative touch screen systems. Observing the efficiency improvements in what is one of the most demanding business environments, he recognized the power and usability of the touch interface.

Windows 7 is the next major release of Windows desktop which is due in production late 2009 and, following on from the phenomenal success of the iPhone dual touch interface, there has been much publicity given to the dual touch capabilities and gesture recognition built into the OS and key applications. Given the visual nature of dual touch gesture usage many publicity shots, promotional material, news items and YouTube videos feature the touch capabilities of this new Windows offering.

There have been a number of Windows releases with built in touch features (Vista had a number of such flavors), specifically those versions aimed at the tablet market and Windows 7 is capitalizing on the increased interest in the touch interface, especially where dual touch offers improved gesturing utilization.

As we all know, point and click type touch has been around a long time and in the right environment is a valued interface, i.e. kiosks, tablets, etc. Dual touch capabilities in the mass market are in their infancy but the iPhone interface showed that in the right environment and on the right device it is a perfect and intuitive interface. Standard desktop utilization of dual touch and gesture interface is still an unproven concept but nevertheless there is sufficient interest that both touch hardware and software manufacturers need to understand its implementation in the new Windows release. General multi-touch issues are covered in the multi-touch support document available on our Touch-Base website. http://touch-base.com/documentation/MultiTouch.htm

In the next few months we will be working extensively on Windows 7 touch integration for current and legacy touch hardware which does not conform to Windows 7 multi-touch HID specifications but that relies on 3rd party driver support to utilize Windows 7 touch functionality.

Firstly the “single touch” basics: a touch device outputs a touch data packet, which contains absolute touch co-ordinates. A calibration process is used to either rescale the co-ordinates to match video resolution as the co-ordinates are received or to remap the co-ordinates in the touch device such that they are rescaled from source. In most OS this coordinate data is received by a driver and passed to the “mouse port” interface to move the system pointer to the point of touch and generate a “mouse click”. For single, non-rotated, desktop monitor usage this simple point and click usage is sufficient.

Under Windows 2000, XP and Vista, if a touch device is HID compliant it can utilize the HID driver supplied with the operating system to control “human interface devices” as long as the HID descriptors and generated data confirm to the HID requirements. A separate calibration procedure is used to remap the co-ordinates in the controller to match the desktop video system. Under Vista additional touch utilities are also enabled in appropriate environments. (http://msdn.microsoft.com/en-us/library/ms702418.aspx)

Alternatively HID, non HID and serial devices can use a purpose built, custom driver, such as our own UPDD driver, to handle simple point and click usage and at the same time implement additional features, such as multi-monitor support and rotated desktop and other desirable features.
Multi-touch usage: true “multi-touch” implementations are mainly confined to specialized or experimental systems and most current uses of the term relating to mass market devices, such as the iPhone or Windows 7 systems, are more correctly referred to as dual touch, that is the device is capable of reporting two separate co-ordinate data streams when two styluses are used. Two simultaneous touches allows for enhanced gesture implementation giving an extra dimension to the touch experience and allows OS and application developers to explore the extra dimension in the user GUI experience.

Dual touch devices need to be integrated with the OS and/or applications and although the following concentrates predominately on Windows 7 most of the interface methods described are appropriate, at least in theory, to any operating system. Three interface methods are available, namely:

<table>
<thead>
<tr>
<th>Method</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-built HID device driver</td>
<td>For HID multi-touch compliant devices</td>
</tr>
<tr>
<td>Purpose built, custom driver</td>
<td>For HID, non HID and serial multi-touch devices and current and legacy (single touch) hardware</td>
</tr>
<tr>
<td>Application Programming Interface (API) and Software Development Kit (SDK)</td>
<td>Supplied with the device. Will offer standard application multi-touch interface to device across different platforms.</td>
</tr>
</tbody>
</table>

A device may utilize any or all of the above and is not necessarily restricted to any one implementation method. Each method is now explored in detail:

**In-built HID device driver:** Windows 7 touch features are automatically enabled for HID-compliant devices that comply to the core HID and multi-touch extensions. The devices must appear as a logo-certified HID digitizer and:
- Hold standard device class in HID descriptor
- Automated descriptor query
- Observe all required HID and multi-touch extension usages

Microsoft is working with a number of touch manufacturers to perfect this interface, including Elo, N-trig, NextWindow and Wacom. The built in touch features caters for consistent multi-touch gestures – double click, right click, panning, zoom and rotate and offers single finger panning. The gestures are utilized by the OS and also available for application use. Multi-touch enabled PCs are already appearing on the market such as the HP TouchSmart (NextWindow) and Dell Latitude XT (N-trig). Further reference material

**How to design and test multi-touch hardware solutions for Windows 7**
http://www.microsoft.com/whdc/device/input/touch_Design-Test.mspx

**WinHEC 2008 – Multi-Touch in Windows 7 – PowerPoint**

**WinHEC 2008 – Multi-Touch Driver Development – PowerPoint**
http://download.microsoft.com/download/5/E/6/5E66B27B-988B-4F50-AF3A-C2FF1E62180F/MBL-T528_WH08.pptx

**Digitizer Drivers for Windows Touch and Pen-Based Computers**
http://www.microsoft.com/whdc/device/input/DigitizerDrvs_touch.mspx
http://download.microsoft.com/download/a/d/f/adf1347d-08dc-41a4-9084-623b1194d4b2/DigitizerDrvs_touch.docx

**Windows Roadmap for Drivers**
http://www.microsoft.com/whdc driver/foundation/DrvRoadmap.mspx

**Developing Multi-touch Application – PDC2008 Video**
### Usage

- **Full integration via the Microsoft purpose build HID driver.**

<table>
<thead>
<tr>
<th><strong>Pros</strong></th>
<th>Conforms to Microsoft’s implemented multi-touch solution to enable full range of OS and application touch features.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cons</strong></td>
<td>Windows 7 utilization only. Specialist skills required to implement advanced HID solution.</td>
</tr>
</tbody>
</table>

### Purpose built, custom driver

For HID compliant hardware that needs additional functionality or for touch hardware that does not conform to HID multi-touch requirements (including legacy single touch hardware) we are investigating the possibility of implementing a custom driver to enable Windows 7 touch features where possible. To this end, custom drivers, such as UPDD will enable as many of the in-built touch and gesture features dependant on the hardware’s capabilities (i.e. single or multi-touch) and Windows 7 restrictions.

The current version of UPDD (4.1.6 at time of writing) works fine with Windows 7 but does not currently interface with Windows 7 touch features beyond standard touch functionality. We hope to release a customized Windows 7 UPDD (4.2.x) driver in Q2’09. It is possible that only digitally signed UPDD driver and hardware combinations will be able to enable the full range of dual touch and gesture features.

<table>
<thead>
<tr>
<th><strong>Usage</strong></th>
<th>Non HID compliant solution to Windows 7 touch features or access to additional touch features implemented by custom driver.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros</strong></td>
<td>Does not require advanced HID controller development and skills.</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Will only work with specific touch hardware supported by the custom driver.</td>
</tr>
</tbody>
</table>

### API and SDK software

In most cases touch screen manufacturers will supply an API interface that allows applications to receive multi-touch input directly and process as appropriate. The information available from the interface may be as minimal as the different touch data packets or may offer gesture type information. Typical examples of multi-touch APIs are available from Next Windows, IR Touch, N-trig, and Nexio as well as our own UPDD driver SDK that caters for direct hardware interfacing. It is likely that most multi-touch hardware will offer some form of SDK for direct application interfacing.

<table>
<thead>
<tr>
<th><strong>Usage</strong></th>
<th>Cross platform multi-touch application solution. Typically used to create specialized multi-touch applications, such as multi-touch games.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros</strong></td>
<td>Not restricted to Windows 7 only but will work across other platforms (2000, XP, Vista, Windows 7, Linux, Mac OS X – as long as the API interface is available for other platforms as is the case with UPDD API). Allows application specific touch features to be implemented.</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Will only work with specific multi-touch hardware supported by the custom driver.</td>
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</table>

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Learning through touch
The story behind the SMART Table

by Heather Ellwood

A freelance writer based in Calgary, Alberta Canada, Heather Ellwood, has an ongoing interest in writing about educational issues, practices and innovations. With over 15 years of journalism experience, she believes that telling a story will always resonate.

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Sehrab and Joseph are two first-grade students in Heather Lister’s multi-aged primary classroom in Calgary, Alberta, Canada. They don’t really care that a team of visionary people from various departments at SMART Technologies worked hard to put this SMART Table into their Montessori classroom. They’re not concerned about the engineers who spent long hours creating the software that makes this table respond to little fingers. And their curiosity likely wouldn’t be piqued by the designers who made prototype tables for many years until, finally, the product was ready for Killarney Elementary School. Sehrab and Joseph are far too busy trying out the SMART Table. “I think that little triangle goes here,” Joseph says, and he pushes a small equilateral triangle into the corner of a tangram shape. Bingo – it turns green. Sehrab nods. Making a twisty motion with his thumb and index finger, he turns a right-angle triangle on its side and shoves it into place. A few more shapes are manipulated until the tangram is completely green and the table erupts with the sound of applause. The boys look up and grin. “I like when it claps,” Sehrab says. It seems he’s not the only one. Those scattered in groups near the SMART Table, immersed in other activities, also look up and grin. Other students circle the table, watching Sehrab and Joseph. They really, really want to take their turn.

Invention to innovation: “Invention and innovation are two different things,” explains Dr. Gerald Morrison, SMART’s external research manager. “Invention is a consequence of intelligent risk taking. What follows is innovation, the process of nurturing the invention until it becomes something wonderful. Both things are quite difficult to achieve, but the SMART Table team rose to the challenge, creating something new and valuable for our customers.” SMART has long been at the forefront of touch-technology exploration – researchers have been thinking about and developing multi-touch and multi-user innovations for over 10 years. The table project, one such innovation, was driven by people who wanted to see how far they could take an idea and what they could do with multi-touch technology.

Multi-touch table prototypes were built in SMART’s labs many years before most people were aware that this type of technology was possible. “We were tracking early research developments in the academic community,” recalls Dr. Morrison, “and we saw researchers in a few university laboratories starting to use our SMART Board interactive whiteboard as a table. We knew this would be something interesting, and so we created multi-touch table prototypes to investigate the possibilities.”

“Invention and innovation are two different things. Invention is a consequence of intelligent risk taking. What follows is innovation, the process of nurturing the invention until it becomes something wonderful. Both things are quite difficult to achieve, but the SMART Table team rose to the challenge, creating something new and valuable for our customers.”

Dr. Gerald Morrison, External research manager, SMART Technologies
Learning through touch: Heather Lister’s grade 1–3 classroom is one of only a handful around the globe that is beta testing the SMART Table. Here, amidst the sounds of excited and energized students, teaching and learning center on student engagement with customized learning activities. The SMART Table suits this environment perfectly. “I see the table as yet another choice for children in the classroom. The idea in a Montessori setting is that children have the freedom to choose activities with the responsibility of choosing appropriate ones. So the table is free for them to go to as long as they are getting their other work done and I see a balance,” she explains.

Lister has only had the SMART Table in her classroom for a week or two. Thus far, she’s left her students mostly to their own devices as they explore it. She wants them to first become familiar with the way the table responds to their touch, without having to think about a whole raft of rules and restrictions. In the weeks to come, she explains, her class will come up with some student-generated suggestions on how to best use it.

When Lister analyzes how well the table has fit into her classroom after only a few short days, two key elements are apparent. First, the table reinforces the power of learning through touch. Touch, she explains, is a cornerstone of Montessori philosophy and education. When children learn with their hands, they build brain connections and knowledge through this movement. “Every single learning tool we have in this classroom is manipulative, and so we’re learning through the tactile, through moving things and through sensory input. The table definitely supports that. With the SMART Table, you’re getting the visual, the auditory and the tactile. We know that the more we can incorporate all of the senses, the better chance that the child is going to retain the knowledge that is being presented,” says Lister.

The second key to the table’s potential in her classroom is the way it uniquely supports children working together. In this early stage of learning, Lister’s students are developing socially, forging connections to others and finding a place in their community. She asserts that the table, which encourages multiple users to collaborate on one activity, will most definitely support their growth. This observation would make the SMART Table team very happy. It was, after all, one of their primary goals for the product.

“With the SMART Table, you’re getting the visual, the auditory and the tactile. We know that the more we can incorporate all of the senses, the better chance that the child is going to retain the knowledge that is being presented.”
Heather Lister, Grade 1–3 teacher, Killarney Elementary School, Calgary, Alberta
Collaborating and connecting: In January 2008, the SMART Table team demonstrated a prototype table at BETT, the world’s largest educational technology event, which is held every year in London, England. After receiving some particularly favorable feedback from educators, the team, including hardware and software developers, invested time building refined prototypes that were robust, durable and repeatable. They wanted to use the multi-touch, multi-user technology to craft a unique product that people would value. The natural fit, of course, was education. “The software team took a look at where education was going as a whole. Instead of building a prototype or a product that was multi-touch just because we could, we wanted something that fit with models of teaching and learning. We saw there was a trend towards learner-centric collaboration, and we recognized how our table technology could be used to enhance learning,” recalls Dr. Edward Tse, a lead researcher with the table team.

At Killarney Elementary School, Joseph and Sehrab are absorbed with one of the table’s learning activities, trying to decide what part of the body the humerus might be. It’s apparent that it is not the camera, the projector or the bright blue sturdy plastic frame that make the SMART Table significant. It’s what’s happening above the table that’s important. “I’ll try here,” says Joseph, and he pulls the word humerus to the spot meant for the liver. The word doesn’t change color, so the boys can tell it definitely doesn’t belong there. They chat excitedly, fingers shifting and pointing. Maybe it’s a part of the arm? Together they move the word to the right place and the table claps yet again. “We did it,” Sehrab says while doing a little dance. It’s the give and take of students working together that makes this product unique. The SMART Table inspires conversations, negotiations, debates, collaboration and, yes, sometimes even dancing. Learners must agree before they can change the activity they are working on, and when completing activities that require multiple choices to be made, multiple learners must come to consensus. Table researchers discovered in early usability studies that some students liked to take charge of the table on behalf of everyone. So SMART designed the product specifically so that users are encouraged to respect others’ personal space and come to a collaborative agreement.

Prototype to product: The SMART Table team compressed the invention to innovation to product life cycle, which usually takes more than ten years, into less than two years. Wallace Kroeker, manager of the custom solutions group at SMART, was tasked with the responsibility of building numerous prototypes. “Our team had been designing and building custom multi-touch tables for several years,” he says. “Then, in early 2006, we were presented with an idea for a table that would support 40, 50 or 60 simultaneous touches. We took that idea and then built and rebuilt several tables until we had something that worked well and was robust enough for commercial deployment.”

After conducting usability studies with teachers and students, 30 prototype tables were built and sent to beta school sites. But before they reached this stage, the team presented their table to top executives at SMART. That’s when the project really began to build momentum. The team showed the table’s applications and talked
about their vision. At one point, a researcher mused, “If this table ever becomes a product....” Nancy Knowlton, SMART’s CEO, interjected in mid-sentence. She said, “You’re mistaken. It’s not if... – this is a product.” It was then that those in the room knew they had crossed a major boundary. This team of researchers, engineers, software specialists and other SMART staff had moved beyond a research prototype and were ready to transition the SMART Table into a product.

**Endless possibilities**: Heather Lister thinks the story of the SMART Table is interesting. But what she really cares about is that the product is not just a novelty. For her, the bells and whistles aren’t important – the key is the table’s potential as a collaborative learning tool that’s easy to use and customize. “I can design collaborative learning activities that support and reinforce a particular topic we might be working on as a class, and the students can work through those activities in groups on the table. In my opinion, the SMART Table is really about what you put into it. So as long as teachers are comfortable with building these activities, I think the possibilities are endless,” Lister says.

The SMART Table team agrees. Though the technology and the multi-touch feature are important, what really excites those who have worked on the table is its unlimited potential. “If we do the SMART Table right, it will have an impact not only on how children learn, but on how people conduct meetings and how we interact with computers in the future. People are going to start thinking about surfaces and devices as collaborative tools,” says Tse. A pig-tailed Killarney student named Haylee, when asked what she likes best about the SMART Table, responds, “The best part is touching it.” One can’t help but wonder in what ways the table will end up touching her, her classmates and others around the world.
Storytelling memories
A tangible connection to Bomber Command veterans
by Tanya Marriott

Tanya Marriott is a senior tutor in digital media design at Massey University in Wellington, New Zealand. She has over six years of experience in the film and design industry and worked with London-based Evolve before leaving to become a founding director of Marmalade Monkey. She is internationally acclaimed in the field of character sculpture through her own doll design work.

As we pass the 60th anniversary of the end of World War II, historians are diligently collecting the memoirs of veterans to preserve for future generations. Public archives of memorabilia, letters, photos and artifacts, in the process of digitization are complimenting the stone memorials of the past. This “material culture of memory” enables human interaction with the past.

In contemporary museum culture this digitized information is presented in either web-based systems, or interactive kiosks. However, this approach to packaging memories and historical data often leaves out much of the depth of the topic information; skimming the surface of the knowledge conveyed, and does not allow the public to “touch history” or research it in any great depth.

Storytelling Memories utilizes a touch sensitive surface as an interface between the viewer and the veterans’ memories. The project consists of a touch sensitive membrane set within a table. A cube controller is located to the side of the touch screen, and peripheral screens project data in front and to the sides. The cube controller (a tangible memory box), when placed near the digital interface surface will “unlock” contained memories, related to specific moments within the veteran’s life from childhood, through the war and after. Turning the cube to one of its six sides accesses these sections.
There is a cube for each veteran enabling the interface to document the memories from the perspective of one person, substantiated by background environments and memories. Each screen interface contains three distinct sections within the “digital drawer” – Veterans memories – located at the bottom of the drawer in separate compartments. The locational environment and maps – located in the center – and contextual or background memories are presented in the surrounding screens. The photos or artifacts are accompanied by audio description. Further depth is added to the memories by associating them to the map or location environment and by relating them to other similar memory testimony. The touch screen interface is developed in flash, with 3D elements modeled in Maya. Each memory photo or artifact when touched opens a larger viewing format. An old Bakelite switch icon activates the audio description, while an icon of a loupe magnifying glass when traced over the image magnifies for closer detail.

The background environment is either a three-dimensional modeled view of the location, or a detailed map. Touching the interface and moving left or right pans the location view for example in the designation section the user is able to turn the gun turret and fire the guns by touch. When pressed roundel buttons located within the 3D environment open related memories from other veterans or factual and technical information within the peripheral screens. Currently the system uses a single touch screen, but would benefit from the added interaction abilities of a multi-touch system. The purpose of the design is to bridge the gap between the desire for knowledge and understanding of the museum visitor and the memory testimony and experience of the veteran. It is hoped that focusing on the memory testimony of each person through time and location, substantiated by contextual data encourages the public to relate to and humanize the veteran.
NEW EXPO - Everything about Touch Panel Technologies are Here
Held within the world's largest FPD trade show - FINETECH JAPAN

TOUCH PANEL JAPAN
1st International Touch Panel Technology Expo

Dates: April 15[Wed] – 17[Fri], 2009
Venue: Tokyo Big Sight, Japan
Organised by: Reed Exhibitions Japan Ltd.
Concurrent Show: 19th FPD & MANUFACTURING TECHNOLOGY EXPO & CONFERENCE
FINETECH JAPAN

Invitation Tickets Request >>> www.tpjapan.jp/en/
Last Word: The touch gaming phenomenon

by Bob Senior

Bob Senior currently lives and works in the Silicon Valley. His career in the touch industry has spanned 27 years. At MicroTouch he charted their international growth to market leadership, invented and brought to market many new products, and was responsible for the introduction of touch to many of what are now volume markets. A co-founder of Touch International, he now serves on the boards of several companies, and as advisor to companies in the touch and hi tech business.

They say from little acorns great oaks grow, and that was certainly the case with the gaming and amusement industries’ use of touch. This was the market that was largely responsible for the growth of MicroTouch, (now 3M Touch Systems)

You might be surprised to learn that this whole phenomenon started in the tiny town of Bozeman, Montana, where an early stage company VLC Inc designed and built the first video lottery terminals. What had fueled this company and others, was legislature in a number of states across the US to permit a small, controlled number of video games machines (gambling) to be sited in age controlled environments (bars). Given that the number of machines was limited, it was important to be able to have a large number of different games available on a single machine to maximize the attractiveness, game play opportunities, and the all important coin drop. Well the whole video lottery market exploded across most of the US states, which created a boom in sales of touch. I can well remember sales in our little company exploding from $30m to $60m in the space of 24 months, propelling the languishing share price from $13 to $90 in the space of less than a year, and putting the president of MicroTouch on the front page of Forbes Magazine. Heady days indeed.

But the phenomenon didn’t stop there. Pretty soon we had begun to get the attention of the big casino guys IGT, Bally, Williams and alike. It didn’t take long for this improved human interface to begin to dominate new machine introductions. Next time you happen to be in Vegas, just take a look around, touch outnumbers traditional reel pull and buttons 10 to 1 now, enhancing the user experience, facilitating new games and increasing the take for the operators.

Next stop for touch was bar-top amusements. Here a couple of players emerged, initially US Games and a company who came to dominate the sector, Merit Industries (now Merit Entertainment). Whilst the US was the market where all this took off, it didn’t take very long for the Europeans to get in on the act. I well remember trolling around the board rooms of the game manufacturers in bleak north of England, frozen Austria and Germany with a US games, bar-top touch machine under my arm. Funny was the Brits sent me away, Ace, Barcrest and alike with “that will never catch on”. In Austria, not only did they embrace the idea they were already down part of the track. A small start up, nestling in the beautiful snow capped hills of Gmunden, Funworld, were taking a swing at this market with a product called Photoplay. Well that was the start of a wild ride for Funworld and MicroTouch in Europe. Some small number of samples at first, but Photoplay-1 didn’t take off, but with more localization of the games and all of a sudden Photoplay-2 took off in a frenzy, actually like nothing seen before. The Photoplay explosion started something in Europe that would change the face of amusement games for the next ten years. The unique style of the company, with their no gambling, no violence policy, innovative game design, legendary Austrian entertainment and hospitality propelled them to worldwide market leadership in their category. It was a ride that lasted for more than six years with MicroTouch before the shine began to wear off and the volumes dwindled as copycats came into the market. Finally due to an insurmountable, at that time, technical issue the rump of the account went to Elo. But true to style the news of the loss was broken in an almost surreal party atmosphere which ended, as far as I can recall, with a bottle of Absolut and orange juice, and the rather hazy vision of our finance director jumping off the bar at the local Segafredo, only to have him show up at the formal meeting the next day in a plaster cast from toe to
hip, and a wheel chair. Oh well, you know it’s time, when the Segafredo bar names a cocktail after you, which even if I say so myself is a pretty good one.

But what now for the gaming and amusement sectors? In my opinion they are set for a really interesting injection over the next couple of years, touch is established, no question, but this sector ticks on coin drop. Affected adversely by a generation hooked on Wii, PlayStation and Xbox, the tide is about to turn. The advent of true simultaneous multiple input touch and large format displays will spur a whole new generation of games and amusements where more than one person at a time can participate. It’s definitely on the way, and I for one can’t wait to see what great entertainment stuff these guys will create once they get into it.

Parting Shot...

If Nintendo hasn't emphasized enough the safety information on handling the Wiimote, then let us take this opportunity to stress it once again: wear the wrist strap, hold it firmly, and give yourself plenty of room. The images show examples of damaged body parts, household furnishings, windows, and TVs. The image on the lower right shows a new safety shield product from Taiwan-based LCDArm that should protect your precious HDTV, even if you should manage to demolish every other object in your living room during a fitful round of Wii-ing. Looking at it, it seems nice enough, but given the erratic world of Wii controller airborne trajectories, it doesn’t seem to be particularly ricochet-proof. An entire website is devoted to documenting the problems associated with “advanced” interactivity using the Wii... http://www.wiihaveaproblem.com
# Display Industry Calendar

Go to [http://www.veritasetvisus](http://www.veritasetvisus) for a more complete calendar and active links. To get your event listed at no cost, feel free to notify mark@veritasetvisus.com

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<td>Digital Holography and Three Dimension Imaging</td>
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**May 2009**

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| May 5-7 | Digital Signage Expo 2009 | Essen, Germany |
| May 5-8 | International Conference on Animation, Effects, Games, and Digital Media | Stuttgart, Germany |
| May 6-7 | Digital Signage Show 2009 | Las Vegas, Nevada |
| May 12-13 | HDTV Conference China | Shenzhen, China |
| May 12-15 | Orbit-iEX | Zurich, Switzerland |
| May 13 | Laser Processing for Plastic Electronics | Abingdon, England |
| May 20-22 | SEMICON Singapore | Singapore |
| May 20-23 | International FPD Korea | Seoul, Korea |
| May 31 - Jun 5 | SID International Symposium | San Antonio, Texas |

**June 2009**

<p>| June 1-2 | SID Business Conference 2009 | San Antonio, Texas |
| June 2 | Dynamic Digital Facades | London, England |
| June 2-4 | SEMICON Russia 2009 | Moscow, Russia |
| June 2-4 | Dimension3 Expo | Seine-Saint-Denis, France |
| June 2-4 | Digital Living Room Conference | Santa Clara, California |
| June 2-6 | Computex 2009 | Taipei, Taiwan |
| June 3-4 | EuroLED 2009 | Coventry, England |
| June 3-4 | HD Expo | Chicago, Illinois |
| June 4-9 | SIIM 2009 | Charlotte, North Carolina |
| June 11-13 | Photonics Festival: OPTO Taiwan, SOLAR, LED Lighting, Optics | Taipei, Taiwan |</p>
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