



Demo Highlights

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'Don't Miss' Projects at Intel's Research Day

The 9th annual Research at Intel Day on June 30, 2010 highlights more than 30 demonstrations from Intel Labs in the areas of user experience, energy, cloud and Internet, platform innovation and transportation. The following descriptions are a guide to help you explore some of the top projects on display:

User Experience

People want to access information stored on their PCs and mobile devices in a more natural, convenient way. Intel Labs predicts all new ways of interacting with technology. Unique environments where computing can take on a new presence such as the classroom, home, car and on-the-go do not always lend themselves to the traditional keyboard and mouse.

Mind Reading: The Ultimate Interface to Computers

Map Demo ID: UX211

In a joint project with Carnegie Mellon University and the University of Pittsburgh, Intel Labs is investigating what can be inferred about a person's cognitive state from their pattern of neural activity. This project will enable people to use their thoughts to directly interact with computers and mobile devices. While still very exploratory, Intel's research is already showing that thought-based user interfaces are not as far-fetched as one might think.

Smart Computing Islands on Everyday Surfaces

Map Demo ID: UX206

A new research system was shown which combines real-time computer vision algorithms, 3D cameras and micro-projection for fast recognition and tracking of physical objects and gestures. This demo uses projected displays on everyday household surfaces like kitchen countertops to create interactive "islands". A user could have a movie playing while making dinner or search and display a recipe right there on the counter. This is easy to retrofit to any home, room and almost any horizontal or vertical surface.

Tangible Surface Interaction with Tablet Computers

Map Demo ID: UX209

Portico brings tangible portable interaction to tablet computers by recognizing and reacting to objects placed on tablet screens as well as objects manipulated on the surface around the tablet. By using cameras mounted on a tablet computer, Portico is portable, yet is not limited by the small size of the tablet screen.

- Intel's Portico prototype uses a 12-inch tablet and provides an interaction space six times the size of the tablet screen.
- Portico's vision system manipulates raw camera input from two cameras to produce simulated top-down views of the screen and surrounding surface.
- A child could use a tablet enabled with this technology at school for example, and learn to understand coins and counting or perhaps shapes by placing them on the tablet.

Personal Vacation Assistant

Map Demo ID: UX208

Personal Vacation Assistant investigates ways to capture and share contextual information while protecting a user's privacy and the security of the user's collected data. This demo showcases a partnership with Fodor's through which Intel deployed a Personal Vacation Assistant to more than 25 tourists visiting New York City. The users' experiences were captured in the device, uploaded to the cloud and, at the user's discretion, a blog entry of their experiences were created and posted complete with pictures, maps and Web links.

Future of Energy:

Technology will enable consumers to become more aware of their energy consumption and manage it; Intel researchers are addressing energy management at a personal and global scale.

Energy Sensors for the Home

Map Demo ID: EN303

Researchers at Intel have invented a new wireless device to make the collection of energy data simple and inexpensive for consumers. The easy-to-use, low-cost sensor needs only to be plugged into the house wiring to instantaneously measure and wirelessly report the power consumption of each electrical load in the home. Intel's goal is to apply Intel technology in ways that empower consumers and small businesses to make valuable changes in behavior and save staggering amounts of energy.

Harvesting Energy for 'Always Charged' Mobile Devices

Map Demo ID: EN304

The Zero Net Energy project is addressing the ever frustrating challenge of keeping mobile devices charged like Bluetooth headsets, mobile phones and even chest heart rate monitors. Researchers are designing a wearable, portable personal network platform that is always on, assisting users to reduce carbon footprints and rarely run out of power. The technique works by using:

- *Energy Harvesting Techniques:* Adding a solar panel, for example, to devices that you wear like a phone or watch, so they can collect energy from natural resources. Or even harvest energy from a user's steps walking between meetings at work for powering devices.

- *Intelligent planning for recommendations in both power and computation:* Devices have sensors which communicate with each other, understand power states and context. A user's watch could understand the harvesting potential, processing needs and power levels of other devices and actually pass off power to other wearable device like chest heart rate monitor if needed.

Future of Transportation:

Research was displayed of the future safe, connected and sustainable car. The next major innovation in transportation is going to be driven by Information Technology – advancing safety, security, efficiency, entertainment and sustainability. Intel sees users' on-the-go lives to be greatly enriched through IT.

Connected Car

Map Demo ID: TR102

To keep pace with consumers' always-connected digital lifestyles and expectations, developers and auto manufactures need platforms that provide seamless integration of home, office and on-the-go consumer experiences in cars. A smart car was displayed onsite with new features incorporated by researchers including:

- *Virtual In-Car Experience:* Using netbooks and smart phones to connect to the vehicle over the Internet for remote engine start, adjust cabin temperature, access vehicle cameras for surveillance, lock/unlock doors and arm/disarm alarm
- *Vehicle to Device:* Connected Car equipped with impact and proximity sensors, sends alerts to connected devices over the Internet when impact is sensed or an object is detected within surveillance zone. In addition, camera recording will be activated and forensic data sent to the cloud for storage, analysis and retrieval.
- *Using visible light:* How we can detect other vehicles' distance and objects in our blind spots to alert drivers and prevent accidents.

Cloud and the Internet

Intel research plans to deal with the flood of data that is upon us. Researchers channel all this data into enhanced online experiences while scaling the capabilities of the cloud engines and data warehouses behind the Internet.

Cloud Central

Map Demo ID: CI510

This exhibit features a collection of projects aimed at making cloud computing more efficient and useful.

- *The OpenCirrus Project:* A collaboration led by Intel, HP and Yahoo to create an open, Internet-scale testbed for advancing cloud computing research, with 10 sites worldwide to date.
- *Making Big Data Interactive:* Uses the OpenCirrus testbed to develop new software tools to make interactive, scalable analysis of massive data sets as simple as using a spreadsheet.
- *Low-power Mobile Computer Vision:* Shows how cloud computing can make cutting-edge computer vision applications practical on mobile devices by offloading computation to processors in your home, office or on the Internet.

Creating and Visualizing 3D Content

Map Demo ID: CI503

This exhibition features a collection of projects aimed at expanding the web to include interactive 3D applications and interactions:

- *Creating and Visualizing 3D Content*: The future of 3D Internet includes scientific visual computing app that renders ‘molecules on the fly,’ and an Internet plug-in to extend 3D rendering capabilities to Wikipedia, and a motion-capture application to read human body movements.
- *Water Wars*: This project explores the use of 3D computer games in environmental policymaking, allowing members of a community to help simulate water management issues to provide insight into better policy and enable more accurate modeling of human behavior.

Platform Innovation

Intel processors and technologies form the basis of platforms that span the computing continuum, from mobile and embedded devices to high-performance workstations and servers. This zone features platform innovations that break down traditional barriers between the devices you use for work and those used in your personal life.

Resilient Microprocessor for Improved Performance and Power

Map Demo ID: P1405

In this demo, a 45nm resilient research microprocessor employs error-detection and recovery circuits to detect and correct errors. Today’s microprocessors leave performance and power on the table, running at more conservative speeds and voltage levels to ensure correct functionality in the presence of noise caused by variations in temperature, voltage, etc.

- The chip adapts to the operating environment to deliver maximum efficiency.
- This approach enables the processor to run with 40 percent higher performance or 20 percent lower energy than normal.
- Computing resiliency technologies will allow lower supply voltage circuits to recognize and recover from errors with no impact to overall device performance.

Light Peak: Low Cost 10Gbps Connectivity

Map Demo ID: P1406

Light Peak is an optical I/O technology enabling bandwidth at the introductory rate of 10Gbps and four channels. Its thin optical fiber, about the width of a human hair, will enable Light Peak to transfer data over very thin, flexible cables and connect mainstream electronic devices to each other for better performance. Consider that the Library of Congress contains more than 10 terabytes of information; using Light Peak technology – operating at 10 billion bits per second – it would take only 17 minutes to transfer the complete library of Congress.

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