Media Laboratory

This year the Media Lab took a giant step forward in redefining its mission when it hosted "h2.0: New Minds, New Bodies, New Identities," a one-day symposium focused on ushering in a new era in human adaptability. The event, which drew more than 900 attendees from throughout the world, introduced the Lab's new focus on "human 2.0": research that explores how technology will merge with our bodies and minds to forever change our concept of human capability.

Director Frank Moss, emphasizing the Lab's theme of "inventing a better future," introduced a day of research that showed how technology will soon be able to blur the distinction between "able bodied" and "disabled" and how sweeping new research initiatives will help us develop a deep understanding of the adaptive mechanisms of humans and then harness this understanding toward the pursuit of a new generation of technology to vastly improve everyone's quality of life. Research initiatives range from techniques to treat conditions such as Alzheimer's disease and depression to sociable robots that monitor the health of children or the elderly and the development of smart prostheses that can mimic—or even exceed—the capabilities of our biological limbs. The event was cohosted by award-winning journalist and disabilities advocate John Hockenberry, now a distinguished fellow at the Media Lab, and NEC career development professor Hugh Herr, head of the Lab's Biomechatronics research group. Special guest speakers included author and neurologist Oliver Sacks, paralympic athlete and model Aimee Mullins, and architect and designer Michael Graves.

The Lab realized several other significant achievements during FY2007, as follows.

MIT announced the 2007 groundbreaking for the Media Lab Extension, designed by Pritzker Prize–winning architect Fumihiko Maki. The 163,000-square-foot, six-story building will feature an open, atelier-style, adaptable architecture specifically designed to provide the flexibility to respond to emerging research priorities. Together with the existing Wiesner Building, the expanded facility will also house the List Visual Arts Center; the School of Architecture and Planning's Visual Arts Program, Design Lab, and Center for Advanced Visual Studies; and the Comparative Media Studies Program. Another key component of the building will be the Okawa Center for Future Children, established at the Media Lab in 1998 through a $27 million donation from the late Isao Okawa.

The Lab's Lifelong Kindergarten group released Scratch, an innovative programming language for kids that allows them to create their own interactive stories, games, music, and animations for the web. With this tool, kids can program interactive creations by simply snapping together graphical blocks, much like LEGO® bricks, without any of the obscure punctuation and syntax of traditional programming languages. Children can then share their interactive stories and games on the web, the same way they share videos on YouTube, engaging with other kids in an online community that provides inspiration and feedback.

The Lab received a $5 million grant from the Knight Foundation to create the Center for Future Civic Media, a project designed to encourage community news experiments and new technologies and practices. The grant recipients were Chris Csikszentmihályi, Muriel Cooper associate professor of media arts and sciences and head of the Lab's Computing Culture group; Mitchel Resnick, LEGO Papert professor of learning research and head of the Lab's Lifelong Kindergarten group; and Henry Jenkins, director of the Comparative Media Studies Program.

The Lab announced the establishment of the Center of Human Augmentation, headed by Hugh Herr, to develop a new generation of cognitive, emotional, sensory, and physical tools to unlock the secrets of the human body and develop a powerful new generation of machines to improve human capability. The interdisciplinary center will include researchers with expertise in the fields of neuroscience, biomechanics, cognitive science, computer science, robotics, physics, linguistics, music, and architecture.

Research Achievements

A sampling of 2006–2007 Media Lab research initiatives includes:

- The world's first *powered ankle prosthetic* that allows for a humanlike gait. The prosthetic ankle utilizes the same strategy as our natural physiology, where ligaments and tendons store energy when the foot is pushed off the ground, and that energy is used to propel the foot forward.
- The *Huggable*, a robotic teddy bear for use in children's hospitals and nursing homes or for early education. Equipped with full-body sensate skin and a series of sensors, it responds to a person's presence and touch and can act as a medical monitoring device.
- *New tools for the analysis and engineering of brain circuits*—work that will help in developing new strategies for systematically repairing damages or malfunctions, augmenting cognition, and revealing insights into human brain function.
- The *Human Speechome Project*, an ambitious attempt to unravel the mystery of how humans naturally acquire language within the context of their primary social setting by studying one child, from birth to age three, for nearly all of his waking hours. The project will yield some 400,000 hours of audio and video data that will be stored in a massive petabyte (1 million gigabyte) disk storage system.
- *Death and the Powers*, a collaboration between the Media Lab and a team of international artists, designers, writers, and theatrical luminaries to create a first-of-its-kind opera that features a robotic, animatronic stage. It will premiere in Monte Carlo in 2008.
- *City Car*, a stackable, electric, two-passenger vehicle that will create an urban transportation network that takes advantage of existing infrastructure (such as subway and bus lines), the economy of car sharing, and cutting-edge design to change the way we live in dense urban areas.
- *Ambient Addition*, a Walkman-like device that changes the sounds around us into music.

- A wearable *emotional social intelligence prosthesis* that helps those with autism understand and read social cues.
- *CargoNet*, a low-cost sensor node for supply-chain monitoring that includes micropower analog processing, RFID (radio frequency identification) reader wake-up, multiple sensor modalities, and micropower operation that extends battery life to multiple years.

For a complete list of Media Lab projects, visit http://www.media.mit.edu/research/projects/.

Exhibitions and Performances

John Maeda has exhibits on both sides of the Atlantic. He is included in the New York Museum of Modern Art's yearlong exhibit Digitally Mastered: Recent Acquisitions from the Museum's Collection, which opened in November, and also has an exhibit, Maeda: MySpace, at the Riflemaker Gallery in London.

The Lab's Smart Cities and Tangible Media groups, in collaboration with MIT's SENSEable City Laboratory, Design Lab, and Department of Urban Studies and Planning, had several projects represented at the Venice Biennale (September–November 2006): Smart Mobility Systems, the City Car, Real-Time Rome, Zaragoza Milla Digital, Zaragoza Adaptable Bus Stop, and Tangible User Interfaces (including the Tangible Media Group's SandScape, Pinwheels, and Ambient Orb).

In April, the Ying Quartet presented Tod Machover's composition ". . . but not simpler . . ." to two sold-out houses and much critical acclaim at Boston's new Institute of Contemporary Art.

Two of Barry Vercoe's early musical compositions were premiered in April by Boston's Oriana Consort, with performances in Cambridge and Boston.

Collaborations

The Lab's research agenda is synergistic with work going on across the MIT campus and involves numerous interdisciplinary collaborations, particularly with researchers in brain and cognitive sciences, bioengineering, management, mechanical engineering, computer science, artificial intelligence, and urban planning. These collaborations are in the form of joint academic appointments, teaching efforts, and research programs. Fifteen of the Lab's graduate students and all of our approximately 150 Undergraduate Research Opportunity Program (UROP) students are enrolled in degree programs outside the Lab's academic program in Media Arts and Sciences. In addition, 10 students are enrolled in the alternative freshman-year program, which completed its eighth year.

The Media Lab is taking a leading role in preliminary discussions with the Sloan School of Management, the Computer Science and Artificial Intelligence Laboratory (CSAIL), and Information Services and Technology (IS&T) to initiate Living the Future, a campus-wide, long-term experiment in open networking. The goal is to work with corporate sponsors to flood the campus with bits and devices bound together in a common, open framework that will inspire new ideas, hardware, and software.

The Laboratory is continuing its collaboration with Taiwan's Industrial Technology Research Institute through NEXT, a consortium that explores new approaches to innovation. Its members include commercial enterprises, research organizations, and governments.

In addition, the Lab's Communications Futures Program, which explores the dynamics, technology opportunities, and regulatory issues that form the basis for communication endeavors of all kind, operates through a series of working groups led jointly by MIT researchers and industry collaborators. It is directed by Dave Clark (CSAIL), Charles Fine (Sloan School of Management), and Andrew Lippman (Media Lab).

In March, a team from the Media Lab spent the day at One Laptop per Child for a summit on the development of the XO machine ("$100 laptop"). As part of this collaboration, Henry Holtzman, the Lab's chief knowledge officer and cohead of the Physical Language Workshop, and Ted Selker, head of the Lab's Context-Aware Computing group, taught the subject "Special Topics in Media Technology: One Laptop per Child."

Sponsors

In FY2007, the Media Lab continued to work on fostering a spirit of collaboration with Lab sponsors, initiating a model for one-on-one relationships between sponsoring companies and individual faculty members.

The Media Lab welcomed six new sponsors: Dai Nippon Printing, Hartford Fire Insurance, Intuit Inc., Logitech, Target Corporation, and VIA Technologies. The Lab also welcomed back three former sponsors: AARP, Hallmark Cards Inc., and Mattel Inc. Chungwa Telecom Co. Ltd. joined the Lab's NEXT consortium.

Fellows

Six corporate sponsors—Highlands and Islands Enterprise, Motorola Inc., the NEXT consortium, Nortel, PepsiCo, and Samsung Electronics Co. Ltd.—funded student fellows. In addition, each year the Lab awards the Steven R. Holtzman Fellowship for Digital Expression, funded by the family and friends of the late Steven R. Holtzman. The following were named fellows during FY2007:

- Laura Nichols and Dan Stiehl (Highlands and Islands Enterprise)
- Takashi Okamoto (Steven R. Holtzman Fellowship for Digital Expression)
- Jae-woo Chung and David Merrill (Motorola Inc.)
- Ryan Chin, Taemie Kim, Jackie Lee, Seth Raphaël, Dawei Shen, Edward Shen, James Teng, and Noah Vawter (NEXT)
- Grace Woo (Nortel)
- Mateusz Malinowski (PepsiCo)
- Matt Adcock, Jason Alonso, Sanghoon Lee, and Andrés Monroy-Hernández (Samsung Electronics Co. Ltd.)

Patents

The Lab filed 20 patents in FY2007. Four were issued, including two US patents on interactive television.

Directed Research Sponsors

In FY2007 the Media Lab submitted 36 proposals for new and continuing directed research projects. Fifteen of these proposals remain under consideration, and 13 have resulted in awards. Slightly more than 60 percent of the proposals submitted were in response to government solicitations (National Science Foundation, Defense Advanced Research Projects Agency, Department of Defense, Office of Naval Research, and National Institutes of Health), and there was additional interest in directed sponsorships on the part of foundations and nongovernmental sources. The proposals ranged in size from $30,000 to $5 million and spanned one to five years, with awards averaging $300,000 per year for three years.

Human Resources/Administration

Patricia Kennedy Graham joined the Media Lab in May as associate director for operations. She comes to the Lab from the Smithsonian Astrophysical Observatory, where she was deputy director for operations and administration. Previously she served as director of administration for MIT's Facilities Department and as an associate group leader at the Lincoln Laboratory. Rebecca Bermont joined the Lab in October as director of sponsor management. Before joining the Lab she was a product marketer in Yahoo!'s Connected Life group, and she helped to define and market Yahoo!'s products for the mobile platform. She works closely with John Maeda, E. Rudge and Nancy Allen professor of media arts and sciences, who has assumed the position of Media Lab associate director of research.

Frank Moss
Director
Professor of the Practice of Media Arts and Sciences
Jerome B. Wiesner Professor of Media Technology

More information on the Media Laboratory can be found at http://www.media.mit.edu/.

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