

## Media Laboratory

In FY2009, the Media Lab established the Center for Future Storytelling. Made possible by a seven-year, \$25 million commitment by Plymouth Rock Studios, the center is taking a new and dynamic approach to how we tell stories in a rapidly changing communications landscape. By applying leading-edge technologies to make stories more interactive, improvisational, and social, researchers are exploring ways to transform audiences into active participants in the storytelling process, bridge the real and virtual worlds, and allow everyone to make and share their own unique stories. Center research also focuses on ways to revolutionize imaging and display technologies, including the development of next-generation cameras and programmable studios. Three Media Lab principal investigators are serving as the center's codirectors: V. Michael Bove Jr., head of the lab's Object Based Media group and the Consumer Electronics Lab; Cynthia Breazeal, LG career development professor of media arts and sciences and head of the lab's Personal Robots group; and Ramesh Raskar, head of the lab's Camera Culture group.

In announcing the center, Media Lab director Frank Moss emphasized the importance of storytelling to our culture, as it is at the very root of what makes us human. This initiative allows us to take the next quantum leap in storytelling, empowering ordinary people to connect in extraordinary ways.

The lab also had several other significant achievements during FY2009.

On May 16, two years after its initial launch, the Scratch programming language was once again in the news when more than 100 "Scratch Days" were hosted in 31 countries, giving children throughout the world a chance to connect through animation, music, games, and other media by using Scratch, the simple programming language developed by the Media Lab's Lifelong Kindergarten group. Here at the lab, 120 children gathered to participate. They are part of an ever-growing Scratch community: every month there are 500,000 unique visitors to the Scratch website, and almost one million have already downloaded the Scratch software. Approximately one project per minute (1,500 per day) is uploaded to the site (<http://scratch.mit.edu/>).

In October, the lab's sponsor week featured a one-day symposium on "Smart, Sustainable Cities" led by William J. Mitchell, head of the lab's Smart Cities research group. The day's events focused on innovative ways to renew urban infrastructures in radical ways, making cities both more responsive to their citizens and more efficient in their use of resources by creating urban "nervous systems" akin to those of living organisms. These systems will be able to sense changes in the needs of their inhabitants and external conditions, replacing rigid, centralized infrastructures with flexible, distributed self-organizing networks.

The lab also announced two research initiatives.

The Autism & Communication Technology Initiative, directed by Rosalind W. Picard and Matthew S. Goodwin, will foster the development of innovative technologies to enhance and accelerate the pace of autism research and therapy. Researchers will

focus on creating technologies that promote communication and independent living by enabling nonautistic people to understand the ways autistic people are trying to communicate; improving autistic people's ability to use receptive and expressive language along with other means of functional, nonverbal expression; and providing telemetric support that reduces reliance on caregivers' physical proximity yet still enables enriching and natural connectivity as wanted and needed.

The Social Health Initiative, directed by Alex (Sandy) Pentland and Frank Moss, focuses on building on a reactive health care system centered on preventing disease rather than treating it. Lab researchers will explore how to form a network of organizations and tools to give people the knowledge and support they need to maintain health, vitality, and happiness throughout their lives. This involves integrating persuasive technologies that help us make better decisions and adopt better behaviors, personal sensing to increase our awareness of our bodies, personal collective intelligence for collecting knowledge from our peers, and socially aware computation and communication systems that are aware of us as social beings.

In addition, the lab established two new research groups: Design Ecology, headed by David Small, which focuses on malleable design that is aware of—and can seamlessly interact with—changing environments, and High-Low Tech, headed by Leah Buechley, which explores how diverse audiences can integrate high- and low-technology materials to build their own technologies and help to democratize engineering.

A sampling of 2008–2009 Media Laboratory research initiatives includes:

- SixthSense, a gestural pendant-like interface that projects digital information onto any surface and allows the user to interact with that information using natural hand gestures. In doing so, it seamlessly integrates information with the user's physical surroundings, making the entire world a computer.
- CollaboRhythm, an innovative platform that goes beyond today's online and video-conferencing technologies to facilitate remote collaboration between patients and their caregivers. The core of the project is a personally controlled health record allowing patients to have all needed information available anywhere, anytime. In June, this project received a first-place prize from the Center for Integration of Medicine and Technology, which addresses major diagnostic and therapeutic challenges in primary health care.
- Graspables, which combine finger-touch pattern sensing with pattern-recognition algorithms to provide interfaces that can “read the user's mind.” For example, one Graspable, the “Bar of Soap,” is a hand-held device that can determine its desired operational mode, such as camera, phone, or remote control, simply based on the position of the user's hand.
- CityCar, a stackable, electric, two-passenger city 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.
- Nexi, a humanoid robot that possesses a novel combination of mobility, moderate dexterity, and human-centric communication and interaction abilities.

With two hands, an expressive face, and multiple cameras, Nexi has enough onboard circuitry to handle low-level control tasks. Wireless networking allows researchers to use remote workstations for high-level control (including cognition) and audiovisual data processing.

- Sociometric Badges, which connect individuals through a sensing platform that logs voice features, proximity to others, face-to-face-interactions, and movement to create a social network diagram of badge wearers, all in real time.
- A set of tools that give ordinary people the ability to build soft, flexible, fabric-based computers. One example is the Soundie, part hooded jacket, part electric keyboard, whose wearer can touch the jacket at different points with different numbers of fingers to turn clothing into a musical instrument.
- The world's first powered ankle-foot prosthesis, an important advance for lower-limb amputees. The device propels users forward using tendon-like springs and an electric motor, reducing fatigue, improving balance, and providing a more fluid, human-like gait.

### Exhibitions and Performances

Tod Machover's opera *Skellig* premiered in November 2008 at the Sage Gateshead, a musical performance and education center in the north of England. The opera is a collaboration between Machover and David Almond, author of the original children's book, *Skellig*. Machover's work was also included in a concert, *Mentors and Protégés: Elliott Carter at 100*, at Brandeis University in January.

Richard The (Design Ecology group) had work displayed in the London Design Museum as a part of the Brit Insurance Design Award 2009. The also earned an honorary mention at Ars Electronica (Linz, Austria) in the interactive art category for his project *Appeel*.

Seamless: Computational Couture, a fashion show highlighting wearable technology, was a part of Boston Fashion Week 2008. Work from the Media Lab was also displayed at the Museum of Science, including *Ok2touch* (Jay Silver), *Piezing* (Amanda Parkes and Adam Kumpf), and *Sp4rkl3* (Rehmi Post).

Stillness Clock, Motion Clock, a project by Seth Hunter (Fluid Interfaces group) and Eric Rosenbaum (Lifelong Kindergarten group), won the audience award, programmer prize, and "fame" award at Processing Time, a coding jam and competition that was part of the Boston Cyberarts Festival. The participants were invited to use Processing, a programming language for visual design that was created at the Media Lab, to create aesthetically pleasing displays of time. It was shown at the MIT Museum through May.

WildUrban: Shared Spaces Between Urban Wildlife and Citizens, an exhibit by visiting scientist Dale Joachim, postdoctoral associate Jean-Baptiste Labrune, and others was a part of the Ecological Urbanism—Alternative and Sustainable Cities of the Future conference at Harvard University; it was also on exhibit from April through mid May.

Connections, an exhibition at the MIT Museum, featured the work of Judith Donath's Sociable Media group. The exhibit explored the social potential of new communication

technologies, challenging visitors to think about the rapidly changing world of social interaction and its ramifications for the future.

Jay Silver (Lifelong Kindergarten group) won second prize in the Harold and Arlene Schnitzer Prize in the Visual Arts for his work on skin-to-nature interfaces. The show was on exhibit at the Wiesner Student Art Gallery during June.

Cati Vaucelle's (Tangible Media group) WoW Pod (created in collaboration with Steve Shada and Marisa Jahn) was exhibited as a part of Eyebeam NY's "Mixer" event, which ran from March through July.

## **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. Twenty of the lab's graduate students and all of its approximately 200 Undergraduate Research Opportunity (UROP) students are enrolled in degree programs outside the lab's academic program in Media Arts and Sciences. In addition, 20 students are enrolled in the alternative freshman-year program.

A joint effort between the Media Lab and MIT's Comparative Media Studies program, the Center for Future Civic Media, established through a four-year grant from the Knight Foundation, creates technical and social systems for sharing, prioritizing, organizing, and acting on information. During FY2009, the center was directed by Media Lab faculty members Chris Csikszentmihályi and Mitchel Resnick, along with Henry Jenkins of MIT's Comparative Media Studies program who left MIT at the conclusion of the academic year. The center hosted its second conference with more than 180 attendees in June 2009.

The Next Billion, an Institute-wide initiative, focuses on unleashing a wave of bottom-up entrepreneurship, collaboration, and wealth creation across the developing world through the development and deployment of innovative applications for mobile devices.

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

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

## **Sponsors**

The Media Lab, whose research and expense volume was approximately \$30 million in FY2009, continued to work on fostering a spirit of collaboration with lab sponsors,

advancing a model for one-on-one relationships between sponsoring companies and individual faculty members.

The Media Lab welcomed 10 new sponsors: Audi-Volkswagen, Avid Technology Inc., Best Buy Enterprise Services Inc., Chunghwa Telecom Co. Ltd., EMC Corporation, Gibson Guitar Corporation, Humana Inc., Plymouth Rock Studios, Procter & Gamble, and Schneider Electric SA.

## **Fellows**

Five corporate sponsors—Audi-Volkswagen, Highlands and Islands Enterprise, IBM, the NEXT Consortium, and Orange Labs Boston—and the Bradesco Foundation 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 FY2009:

- Michael Siegel (Audi-Volkswagen)
- Andrés Monroy Hernández (Bradesco Foundation)
- Leo Bonanni and Benjamin Waber (Highlands and Islands Enterprise)
- Richard The (Steven R. Holtzman Fellowship for Digital Expression)
- Drew Harry (IBM)
- Ken Endo and Eric Rosenbaum (NEXT Consortium)
- John Moore (Orange Labs Boston)

## **Patents**

The lab filed 20 patents in FY2009, and three were issued, including one US patent for a touch-panel input device.

## **Directed Research**

In FY2009, the Media Lab submitted 67 proposals for new and continuing directed research projects. Nearly 75% of these proposals remain under consideration, and nine have resulted in awards. Approximately 76% 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), with additional interest in directed sponsorship from foundations and nongovernmental sources. The proposals ranged in size from \$20,000 to \$3.4 million and spanned six months to five years, with awards averaging \$295,000 per year for three years.

## **Human Resources/Administration**

Michail Bletsas has returned to the Media Lab from One Laptop per Child to assume his previous position as director of NeCSyS (Network and Computing Systems). Mary Young, a 28-year MIT veteran, was promoted from senior fiscal officer to director of finance. Young came to the lab in 2007 from the Research Laboratory of Electronics

(RLE), where she had been a senior fiscal officer. The newest member of the lab's finance team is Marissa Wozniak, who joined the lab as assistant fiscal officer, coming from MIT's Professional Education Program.

During FY2009, the lab also welcomed Tanya Giovacchini, executive director of the lab's Center for Future Banking, who is responsible for managing the center's operations and the relationship between the Media Lab and Bank of America; Nina Wishnok, who joined the lab's Communications group as a half-time graphic designer; and Mirei Rioux, who is program manager for the Things That Think consortium.

**Frank Moss**  
**Director**

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

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