

Building the next big thing: 25 years of MIT's Media Lab

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Last Friday, MIT's Media Lab hosted a series of talks to celebrate its 25th anniversary. Anyone who has paid attention to technology news over that period has undoubtedly heard of the various strange and interesting developments that make their way out of the Lab—*Guitar Hero*, LEGO Mindstorms, One Laptop per Child, and E Ink all started off as Media Lab projects. But far fewer people fully understand how the Media Lab operates, fits into MIT, and encourages such a creative environment; about half of the anniversary celebration's program focused on simply defining what the Media Lab is. So, for the benefit of those who weren't there, we'll attempt to explain how it has generated its reputation for being at the leading edge of technology.

An independent lab

According to one of its founders, Nicholas Negroponte, the Media Lab was set up as an independent department within MIT because that would allow it to make its own tenure decisions and choose its grad students. That latter factor is a significant one. Most departments accept grad students based on their prospects for academic success; the Media Lab attempts to select ones that will best be able to help with some of the ongoing projects.

Normally, academic departments rely on their faculty to bring in funding, either through individual grants or by contributing to department-wide projects. In contrast, the Media Lab is completely industry-sponsored; there is literally a LEGO Lab in the building (Swatch, Motorola, and a few other companies sponsor other ones). Once they contribute above a certain level, the sponsors get access to any intellectual property that comes out of the Media Lab. In essence, the entire lab acts in much the way that older industrial labs, like Bell Labs and Xerox Parc, used to, in terms of providing a source of blue-sky research. Instead of constantly worrying about funding, the faculty and students can focus on their project, with the exception of sponsors' weeks, when they have to convince companies to start or continue their support.



Many of the individual labs are open-plan and high ceiling so that people know what's going on in other labs.

This structure helps ensure that any technology to come out of the Lab has a smoother path to the market. But another factor that contributes to its influence is the fact that the faculty has an emphasis on building things that actually work. Andrew Lippman, who has spent 35 years at MIT, talked about how the Media Lab faculty and students focus on building functional devices, rather than prototypes that are only good for demonstrations.

As Negroponte described it, this helped make it a solutions-based lab, even though some of the whimsical devices are made in such a way that people "don't know what the solution is for." Companies, he suggested, can sometimes look over the technology behind the demos and find solutions to the problems they face.

A broad definition of media

The Media Lab was founded based on the belief that the emergence of digital technology were blurring the boundaries between traditional media, like art and architecture, and the means of creating them, which explains why many of the advances associated with the Lab, like wireless mesh networking, aren't what most of us think of as media. That has worked to its advantage; several of the speakers commented on how the Lab got some extra attention from people in print and broadcast outlets simply because of the journalists' self-interest in anything media-related.

Still, the day was filled with examples of cases where the projects of the Media Lab blurred the lines. Lippman discussed how, in the 1970s, the Media Lab made the first e-book with a full font rendering system, using a traditional TV and a 12-inch laser disk to hold the content. Margaret Minsky discussed how some students embedded a video camera in an autonomous blimp, and set it loose in the building's atrium, where it sent back live video of its wanderings. (She also noted they neglected to give it the ability to return to earth when its batteries ran out, so they had to use water pistols to soak it sufficiently so that it would fall back to the ground.)



It may be a functioning electric car prototype, but to MIT it's media.

Some of the other projects were equally whimsical. Mike Hawley, who has worked for both George Lucas and Steve Jobs, talked about the creation of Poststitch, an interpreter that took a Postscript file as input and converted it into a machine-sewable pattern. It started out as a way to make a sport jersey, and eventually morphed into a project that sewed musical keyboards into clothing using conducting thread. He also worked on some kitchen technology, including laser-based vegetable slicers and an olfactory input system for computers. Those projects picked up the nickname "Counter Intelligence," and got them both sponsors and a call from the NSA, trying to find out what they were up to.

What's the next media?

Although a lot of the Media Lab's developments were ahead of their time (and a lot of them seem to be staying that way), the general concept that digital information processing is part of the media experience, from art to engineering, is now very mainstream. In the words of Negroponte, digital is the new plastics. So, it appears the Media Center is now in search of the next big thing. Based on some of the recent faculty hires who spoke on Friday, the next big thing may be biology.

Ed Boyden spoke of his work on optogenetics, in which genes for light-regulated ion channels are inserted into nerve cells. When hit with light of the right wavelength, these channels will either trigger or suppress a nerve impulse, effectively putting the nerves under the researcher's control. So far, this has mostly been used to attempt to identify the neural circuitry of the brain, producing some high-profile papers in the process. But Boyden has bigger plans; he showed video of a mouse that lacks rods and cones in its eyes, but has a channel gene expressed in the set of nerve cells that resides one step closer to the brain. These mice can navigate a water maze based on light-driven cues.

He's currently testing a miniature device that can take input at several wavelengths of light, and hopes to use it as an

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implant to provide finer control over neural circuitry using several of these channels at once.



Hugh Hurr strides the stage on his powered limbs, taking advantage of their control circuitry.

Other biology-focused work will improve products that are already on the market. Hugh Herr lost both of his lower legs to frostbite in a mountaineering accident. Right now, he's already walking on artificial limbs with a set of nine sensors and six processors that adjust the angle and torque of various parts to provide an experience that's much closer to a normal walk (or run). But he's already planning to add parts that sense the remaining muscles on his legs, and use those to provide even more realistic movements. And, longer term, he expects to link up implants directly to the nerves themselves.

Even a traditional field like architecture is feeling the influence of biology. Neri Oxman is an architect with an MD degree, and her work focuses on how to use the design principles of biological materials to produce more functional and sustainable structures. In current buildings, the materials are custom-designed for specific purposes; evolution didn't work like that. Instead, biological materials use a limited number of repeated fibers, but repurpose them in a variety of ways. Oxman is interested in learning how to use similar functional units to produce a diverse set of structures.

Biology isn't everything as the Media Lab moves into its second quarter century. Other new faculty talked about their work in data visualization, new imaging techniques, and art projects driven by open hardware, plus a lot of the earlier faculty are continuing their work on things similar to the ones that they started with. But if the presentations at the Media Lab's anniversary celebration were anything to go by, we may be watching biology catch on as the new media before too long.