The MIT Media Lab at a Glance

Actively promoting a unique, antidisciplinary culture, the MIT Media Lab goes beyond known boundaries and disciplines, encouraging the most unconventional mixing and matching of seemingly disparate research areas. It creates disruptive technologies that happen at the edges, pioneering such areas as wearable computing, tangible interfaces, and affective computing. Today, faculty members, research staff, and students at the Lab work in 24 research groups on more than 350 projects that range from digital approaches for treating neurological disorders, to advanced imaging technologies that can "see around a corner," to the world's first "smart" powered ankle-foot prosthesis. The Lab is committed to asking the questions not yet asked–questions whose answers could radically improve the way people live, learn, express themselves, work, and play.

Organization

The Lab is supported by more than 80 members, including some of the world's leading corporations. These members provide the majority of the Lab's more than $60 million annual operating budget. Businesses represented range from electronics to entertainment, fashion to health care, and toys to telecommunications.

Research is conducted in a highly collaborative and antidisciplinary environment. Many of the technologies and applications conceived at the Lab are tested and refined through experiments at MIT and in the field, in cooperation with individual member organizations.

Unlike other laboratories at MIT, the Media Lab comprises both a degree-granting Program in Media Arts and Sciences and a research program. Over 60 faculty members, senior research staff, and visiting scholars lead the Lab's research program, working with over 150 research staff members, research affiliates, visiting scientists, and postdoctoral researchers. Close to 100 other staff members support the Lab's research, facilities, and administration.

Graduate enrollment totals 164, with 89 master's and 75 doctoral students. In addition, more than 30 graduate students from other MIT departments carry out their research at the Media Lab, and more than 200 undergraduates come to work at the Lab each year through MIT's Undergraduate Research Opportunities Program (UROP).

Research Efforts

Centers and joint programs combine the work of Media Lab researchers with collaborators throughout MIT, and smaller, more focused special interest groups and initiatives deal with particular subject areas.

Advancing Wellbeing, funded by a $1-million grant from the Robert Wood Johnson Foundation, combines academics with on-the-ground ideas to promote better health at MIT and beyond.

CE 2.0, a collaboration with member companies to formulate the principles for a new generation of consumer electronics that are highly connected, seamlessly interoperable, situation-aware, and radically simpler to use.

The Center for Civic Media, a joint program with MIT's Comparative Media Studies program, funded through a grant from the Knight Foundation, creates and deploys technical and social tools that fill the information needs of communities.

The Center for Extreme Bionics, which will draw on the Media Lab's strengths in synthetic neurobiology and biomechatronics, along with the MIT Langer Lab's pioneering work in biotechnology and medical devices, to achieve radical advancements in the rapidly evolving field of bionics–work that aims to repair or even eradicate serious physical and mental impairments such as dementia, Parkinson's, or limb loss.

Communications Futures Program, a joint effort focused on broad issues of communications–from telephony to RFID–with MIT's Sloan School of Management and the Computer Science and Artificial Intelligence Laboratory (CSAIL).

Emerging Worlds is a co-innovation initiative to solve problems in areas such as health, education, financial inclusion, food and agriculture, housing, transportation, and local business. It is focused on emerging opportunities to address pressing challenges and leapfrog existing solutions.

Laboratory for Social Machines, funded by a five-year, $10-million commitment from Twitter, develops new technologies to make sense of semantic and social patterns across the broad span of public mass media, social media, data streams, and digital content.

Media Lab Learning, exploring learning across dimensions–from neurons to nations, from early childhood to lifelong scholarship, and from human creativity to machine intelligence. The initiative is designing tools and technologies that change how, when, where, and what we learn; and developing new solutions to enable and enhance learning everywhere.

Open Agriculture (OpenAg), builds collaborative tools and platforms to develop an open-source ecosystem of food technologies that enables and promotes transparency, networked experimentation, education, and local production.

Terrestrial Sensing, which explores unconventional ways to sense and visualize inaccessible natural environments–places where it is impossible for humans to go physically, such as underground, undersea oil fields, and the atmosphere.

Ultimate Media, a multi-group project that is working to build a new platform for visual media that reinvents real-time exploration and contribution.

A Sampling of Research Achievements

A **big data study** that finds that 90 percent of "anonymous" credit card users' metadata can be reidentified with just a few pieces of information.

Collaborative symphonies, a new "musical ecology" for massive, crowd-sourced, and interactive music compositions. This democratic approach to composing integrates urban sounds and musical ideas from the public with an original musical composition. It is a way for a symphony to be composed not only *for* a city, but *with* a city.

Expansion Microscopy, a new technique to physically enlarge brain tissue samples, giving researchers high-resolution images of cellular activities.

Mushtari, the world's first photosynthetic wearable that combines multi-material additive manufacturing and synthetic biology. The work is a prototype for an external digestive system embedded with living matter.

Designed as a covered three-wheeler, the **Persuasive Electric Vehicle (PEV)** makes biking compelling for various demographics. PEV addresses sedentary lifestyles, provides energy-efficient mobility, and takes advantage of existing bicycle lanes.

TRANSFORM, an interactive dynamic display that fuses technology and design to convert a tabletop into a dynamic machine driven by a stream of data and energy. It comprises three dynamic shape displays that move over 1,000 pins up and down in real time.

Inventing the future at the MIT Media Lab

When the MIT Media Lab first opened its doors in 1985, it combined a vision of a digital future with a new style of creative invention. It pioneered open computer gardens, personal computing on every desk, and a multimedia network to every room–a radically new set up for the time. It brought together researchers from far-ranging fields who were passionate about creative expression, with pioneers in the emerging field of digital technology. Many visitors and sponsors came to see not only what the Lab did, but also how it did it. Emphasis was less on current market needs and more on imagining the future.

In its earliest years, some saw the Media Lab as a house of misfits. The Lab, on the other hand, saw itself as an exciting new paradigm for research. Here, the emphasis was on building; the Lab's motto was "demo or die." As early as 1985, the Lab was developing image technology for the "home delivery" of movies; new approaches to data compression; and Csound, one of the most widely used software synthesis systems. Frequently the Lab developed a concept that was so far ahead of the curve that it took years–sometimes decades–for society to catch up. Early on, for example, Lab founders demonstrated the Aspen Movie Map, a revolutionary hypermedia system that allowed the user to take a virtual tour through Aspen, Colorado–a system that pre-dated Google Earth by some 25 years. The Lab demonstrated electronic postcards in the mid 1990s, and conducted breakthrough research on personalized news delivery. It was an early developer of wearable computing, pioneered digital tools for constructionist learning, and was experimenting with online sociable media long before there was Facebook or Twitter.

Throughout the 1980s, Lab researchers developed the first programmable bricks for LEGO construction kits, as well as research for "television of tomorrow," where Lab researchers drove the industry to scalable, extensible, digital generations of television. In 1985, the Lab created the world's first multi-color, computer graphic hologram; in 1990, it demonstrated the world's first real-time, moving synthetic hologram.

The next decade brought about research breakthroughs in sensors that could detect a user's actions by measuring the body's influence on an electric field; software agents with collaborative filtering that help tap into other people's collective wisdom; systems that allowed 3D interaction with virtual creatures that could "see" and "hear"; and Net-Sound, capable of delivering an entire Beethoven symphony over the Internet in about 10 seconds. It also introduced the world to computers that could recognize and respond to emotion, as well as inexpensive, wireless "digital town centers" capable of providing even the most remote and underdeveloped areas of the world with digital access.

The twenty-first century brought about even broader-reaching Media Lab work with a strong emphasis on improving the human experience. The Lab focused on new technologies that seamlessly merge with our bodies to forever change our most basic notion of human capabilities. This includes the development of the world's first robotic ankle-foot and knee prostheses capable of successfully mimicking the action of a biological ankle, and, for the first time, providing amputees with a truly humanlike gait. Lab researchers are also advancing an ingenious new technology for analyzing and precisely controlling neural circuits, including those in the brain–research that has implications for developing radically new medical technologies to treat brain disorders such as Parkinson's disease, or for changing mental and emotional states, such as severe depression.

After 30 years, the Lab remains committed to the fundamental principle that the most imaginitive work comes from a unique "antidisciplinary" culture advanced by a dedicated group of passionate researchers. Looking forward, the Lab's success will continue to be based upon its position as a renegade research environment that not only allows for, but encourages, researchers to ask the questions that no one else has thought to ask.

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Top 30 Spinoff Products or Platforms

Amazon Kindle, Sony Reader, Barnes & Noble nook (all use Electronic Ink technology developed at the Media Lab)

LEGO Mindstorms

MPEG-4 Structured Audio

SeatSentry Smart Air Bag systems, Media Lab sensor technology commercialized by NEC Corporation

Guitar Hero, developed by spin-off Harmonix Music Systems

BiOM, the first bionic lower-leg system for amputees, commercialized by spin-off iWalk

Optogenetics, molecular tools for controlling neurons with light

XO Laptop, developed by spin-off One Laptop per Child

Scratch family of programming languages for kids

Bluefin Lab's large-scale data analytics platform, now powers Twitter globally

Formlabs' affordable, high-resolution desktop 3D printing

Gen9's BioFab, a platform to make synthetic DNA easier to design, use, and access.

Low-cost eye diagnostic tools for mobile phones, being brought to market by spin-off EyeNETRA

The Echo Nest machine-learning platform for music, now part of Spotify

Collaborative filtering recommendation technology

Reality mining, for interpreting human behavior, commercialized by spin-offs including Ginger.io, Humanyze, Cogito, and Jana

Technologies to measure and provide analytics on emotional responses, with applications ranging from market research (spin-off Affectiva) to monitoring systems for seizure detection (spin-off Empatica)

JIBO, the friendly, social robot for the home that can sense, respond, and learn from its users

Makey Makey, Circuit Stickers, Sifteo Cubes: maker-inspired kits for creativity and learning

g-speak, developed by spin-off Oblong Industries, first seen in *Minority Report*

Wireless Mesh Networks, first commercialized by Nortel

Open Mind Common Sense/ConceptNet platform, collecting general knowledge for computer learning via crowdsourcing

3D digital holographic printing, commercialized by spin-off Zebra Imaging, Inc.

CityCar, a stackable, folding electric car

Hyperscore music composition software, commercialized by spin-off Harmony Line, Inc.

Tangible IP Network Designer and the Tangible Business Process Analyzer, developed by NTT Comware

Photomosaics, brought to market by spin-off Runaway Technology, Inc.

Sourcemap, open-source, supply-chain mapping

Audio Spotlight, brought to market by spin-off Holosonics

Mercury RFID Readers, commercialized by spin-off ThingMagic, now part of Trimble

MIT Media Lab Members

Consortium Research Lab Members
Dentsu-Aegis Network Ltd.
Digital Garage
Hisense Co. Ltd.
Jaguar Land Rover
LKK Health Products Group
NHK
Panasonic Corporation
RECRUIT
Samsung Electronics Co., Ltd.
TCL Multimedia
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Consortium Lab Members
21st Century Fox
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Arçelik
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Biogen
Bloomberg L.P.
Bose Corporation
BT
Cisco Systems, Inc.
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Converse
Culture Convenience Club Co., Ltd.
DAQRI
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DENSO
DirecTV
DP World
EMC
Emotibot
Estee Lauder
Ferrero
Fidelity Center for Applied Technology
Flipkart
FutureWei Technologies, Inc. / Huawei
General Electric
GlaxoSmithKline
Globo
GoDaddy
Google
Gucci
Hoffmann-La Roche Inc
IBM
IDEO
IKEA
Infocast Limited

Intel
Intuit Inc.
KYOCERA
MacAndrews & Forbes, Incorporated
MedImmune
Mercedes-Benz Research &
    Development North America
Misk Foundation
Mori Building Co., Ltd.
NEC Corporation
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Olympus Corporation
Ooredoo
Otsuka America Pharmaceutical, Inc.
QUALCOMM Incorporated
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Starcom Mediavest Group
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Target Corporation
Tata Consultancy Services
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The Boston Consulting Group
The Coca-Cola Company
The LEGO Group
TOPPAN Printing Co., Ltd.
Toyota Motor Corporation
Turner Broadcasting, Inc.
Twitter
Unilever
Univision
Viacom
VSP Global
Welspun
Whaley
YinduOgilvy

Endowment and Naming Grants
Asahi Broadcasting Corporation
Armand and Celeste Bartos
Benesse Corporation
BT
Joseph Chung
CSK Holdings Corporation
Alexander W. Dreyfoos, Jr.
Informatix, Inc.
The LEGO Group
Dorothy Lemelson
LG Electronics, Inc.

MasterCard International
Misawa Homes
Motorola, Inc.
Masanori Nagashima 1976
NEC Corporation
Isao Okawa
Schlumberger
Jeffrey L. Silverman 1968
Sony Corporation
Swatch AG
Telmex
Toshiba Corporation
Philippe Villers

Research Contracts and Special Funds
Agence Française de Développement
Alfred P. Sloan Foundation
Austrian Institute of Technology
Bill & Melinda Gates Foundation
Boston University / NIH, NSF
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A Unique Perspective

Innovation is essential for achieving competitive advantage in today's high-pressure business environment. Yet it is often too easy to become internally focused, losing sight of key sources for inspiration, customer needs, and changing marketplaces, thus stifling creativity and long-term growth.

The MIT Media Lab is a unique resource to help companies address these issues. Its approximately $60-million annual operating budget and world-renowned faculty support close to 25 research groups and over 350 projects, ranging from smart prostheses for amputees, to creative computation for kids, to designing cities of the future. Broad research foci include the future of food production, learning, health and wellbeing, arts and invention, sensor networks, affective computing, innovative interfaces, and sociable robots.

At first glance, much of the Media Lab's research may seem costly or tangential to current business realities, but for 30 years, the Lab has demonstrated that seemingly "far out" research can find its way into the most conventional—and useful—applications. Over the years, examples have ranged from a sensing system developed for magicians Penn and Teller that became the basis for a life-saving, baby-seat sensing device for automobiles; to electronic ink enabling e-readers; to a new generation of digital interfaces; to successful commercial ventures, such as Guitar Hero.

Benefits for Members
The Media Lab works closely with its member companies to provide a springboard for innovative products and thinking. By pursuing a range of research that no single company could match, the Lab provides an abundance of ideas, technologies, and paradigms for the future. Member companies can engage with the Media Lab for:

Knowledge Transfer. One of the Lab's most important benefits, this includes the transfer of creative ideas for the use of a single new technology, or the convergence of several technologies.

Interactive Demonstrations. Coming to the Lab to see research projects firsthand—and to engage in impromptu discussions about the demos—gives members valuable insights into new approaches that can be applied to their own research agendas. The Lab hosts regular member events, and other visits are possible. Lab researchers may also visit member sites and events.

Student Recruitment. One of the Media Lab's greatest strengths is the quality of its students. Members can recruit these students to join them as interns during term breaks or as full-time employees after graduation.

Neutral Meeting Place for Cross-Company Collaboration. Members recognize the value of meeting other members, opening the possibility for collaboration.

Business Connections. Many members use the Media Lab to build business connections and specifically to collaborate with downstream partners, which can enable them to come to market with a more complete product. Plus, connections with Media Lab start-ups provide a rich source of ongoing technology and product development.

Intellectual Property. The Media Lab has spawned dozens of new products by our members, and over 150 start-up companies. Members at the consortium lab level and above have non-exclusive, royalty-free license rights, in perpetuity, to patents registered during their period of membership.