

JEFF LIEBERMAN

Email for physical address and phone number; lieb@alum.mit.edu

Education (MIT, Cambridge MA)

- **BS in Mathematics, Minor in Music**— Graduated June 2000
GPA: 4.8/5.0 (Overall), 5.0/5.0 (Math)
- **BS in Physics**— Graduated June 2000
GPA: 5.0/5.0
- **Masters of Science in Mechanical Engineering**— Graduated June 2004
GPA: 4.9/5.0
- **Masters of Science in Media Arts and Sciences, focus in Robotics**— Graduated June 2006
GPA: 5.0/5.0
- **PhD in Media Arts and Sciences**— Graduation expected 2010

Experience

• **Art / Kinetic Sculpture Experience** —

Scientifically inspired artwork and explorations <http://bea.st/sight/sculpture.shtml>

– Selected Pieces and Showings

- * **Absolut Quartet** (2008): A music making machine like no other. Three instruments, including a ballistic marimba that launches rubber balls 8' into the air precisely aimed at notes, perform an improvised melody based on user input. Video of the interaction is given to the user and the performance is made in a live space for the public to view.
- * **light bulb** (2007): A floating magnetically levitated wirelessly powered light bulb. Levitates at 3" distance from the nearest object. Shown at NEXT Festival, Denmark 2008, Sonar Festival, Barcelona, 2007, Collision 8, Cambridge MA 2005.
- * **Taptap** (2006): A system to record and playback human touch for emotional connectivity and rehabilitation. Shown at Seamless II Fashion Show, Boston Museum of Science, 2006.
- * **Applause** (2005): Interactive movie theatre addressing issues of group dynamics, politics, and control. Shown Collision 7, Boston Cyberarts Festival. Featured in Arts and Media magazine.
- * **Slink** (2004): 2000 LEDs strobe a resonated 3' spring yielding visual physical illusions. Shown Collision 6, The Boston Art Windows Project [4 month public installation], shown in Siggraph 2006. Featured in the Boston Globe.
- * **Sketch** (2003): A computer-controlled (CNC) drawing machine, draws with any writing implement.
- * **Cyberflora** (2002): Described above. Shown in the Cooper-Hewitt Smithsonian Design Museum, 10 month installation 2002-2003. Featured in 'Inside Design Now' and numerous other publications.

• **Robotics / Artificial Intelligence Experience** —

Research Assistant MIT Media Lab Robotic Life Group <http://robotic.media.mit.edu>

– Research and develop robotic mechanical systems, hardware, and software. Projects include:

- * **Motor Learning Robotic Wearable Suit** (2006): Developing a process to teach motor learning skills [dance, sports, etc] and for motor rehabilitation, using kinesthetic feedback on the human body in real-time through a wearable robotic suit. Patent pending.
- * **The Huggable Robot** (2006): Designed the 3-DOF neck mechanism and custom voice coil actuators for the huggable robot, a teddy-bear robot intended to supplement pet therapy in hospitals and for the elderly.
- * **Multi-Axis Motor Control Hardware** (2005): Designed and constructed an 8-axis, modularly expandable hardware motor controller providing a 3kHz PD feedback control system, output power amplification, and digital and analog feedback, with force feedback and current sensing capabilities. Used to control the huggable robot.
- * **Robotic Learning by Demonstration** (2004): Developed a method by which a robot can observe a discrete set of actions of a human, and generalize these actions to perform the task in new unobserved environments.
- * **Cyberflora** (2003): Design lead for a 20-robot, 48-DOF installation made for the Cooper-Hewitt Smithsonian museum in NYC. A 10 month installation comprising 4 species of robotic flower, with algorithmically generated music and lighting cues based on viewers' behavior, with each flower possessing engagement and fear responses to viewers.

• **Photography Experience** —

Specialist in Portrait, Landscape, High Speed Photography and Photomanipulation <http://bea.st/sight/photo.shtml>

– Selected Works and Technologies

- * **MIT Undergraduate Research Journal.** Photography for two magazine covers 2007-8.
- * **Double Laser Trigger:** Allows sub microsecond accuracy in bullet strobe triggering with velocity calculations through multiple laser crossing measurements.
- * **FHM (For Him Magazine):** 2-page full spread featuring a variety of high speed photography, millions in distribution.
- * **Massive Change Exhibit:** Submitted a selection of photography for a touring exhibit to see three continents, seven cities, and over a million visitors. See <http://massivechange.com> for details
- * **High speed video:** Sequence of breaking glass taken for a high resolution lenticular display for the Yankowitz & Holden art team.
- * **MIT Work:** Assorted photos of events and art photos shown in the MIT Tech newspaper and MIT Tech Photo Gallery publication. Also high-speed video selected for MIT front page.

● **Music/Theatre/TV/Film Experience** —

Piano/Keyboard/Guitar Performance, Improvisation, Electronic Music <http://bea.st/sound/sound.shtml>

– TV

- * **Time Warp:** Host of Discovery Channel primetime TV show about uses of technology [such as high speed video] to show viewers new things about the world. Currently filming first season to air Fall 2008. Also story and technical consultant to the show.

– Selected Musical Groups and Gigs

- * **gloobic:** Fully improvised and composed acoustic/electronic music. Two albums released. <http://gloobic.bea.st>
- * **Orchestra of Excited Strings:** Performed in Arnold Dreyblatt's quintet, in Boston and New York at Tonic and the BAM Marathon. Recorded and released CD 'The Adding Machine' on Cantaloupe records.
- * **American Repertory Theatre:** Performed on Guitar, Piano, Keyboards for the ART's productions of Oedipus [2004] and Orpheus X [2006]. Details at <http://amrep.org>. Toured productions in the Edinburgh Theatre Festival [Edinburgh, Scotland], and the Hong Kong International Arts Festival.
- * **Gamelan Galak Tika:** Guitar and Keyboards for assorted concerts in the US as well as a two week tour in Bali, Indonesia. Also performed at the BAM festival, and in Carnegie Hall.
- * **Other:** Concerts in FL, MA, DC, Prague, Austria, pianist for Festival Jazz Ensemble two years. Founded MIT Music Group L/S. Performed with jazz quartet at the Kennedy Center, Washington DC.

Curriculum Vitae

● **Refereed Publications** —

Robotics and Artificial Intelligence Papers Published while at the MIT Media Lab

- *TIKL: Development of a Wearable Vibrotactile Feedback Suit for Improved Human Motor Learning* (Transactions on Robotics [T-RO], 2007)
- *Accelerated Motor Learning using Robotic Tactile Feedback* (International Conference on Robotics and Automation [ICRA], Italy, Rome 2007)
- *Accelerated and Improved Motor Learning using Kinesthetic Feedback* (Masters Thesis, MIT 2006)
- *The Huggable: A Therapeutic Robotic Companion for Relational, Affective Touch* (IEEE Consumer Communications and Networking Conference, Las Vegas NV 2006)
- *Design of a Therapeutic Robotic Companion for Relational, Affective Touch* (RO-MAN conference 2005)
- *Teaching a Robot Manipulation Skills Through Demonstration* (Masters Thesis, MIT, 2004)
- *Tutelage and Collaboration for Humanoid Robots* (International Journal of Humanoid Robots, 2004)
- *Humanoid Robots as Cooperative Partners for People* (IJHR, 2004)
- *Improvements on Action Parsing & Action Interpolation for Learning through Demonstration* (Humanoids, 2004)

● **Selected Showings** —

Art and Photography Installations

- *Next Festival.* Aarhus, Denmark 2008
- *Hong Kong International Arts Festival.* Hong Kong 2008
- *Absolut Quartet, guerilla gallery in Lower East Side, NYC.* NYC, New York 2008
- *Edinburgh International Theatre Festival.* Edinburgh, Scotland 2007
- *Sonar Music and Arts Festival.* Barcelona, Spain 2007

- *Revolution Lounge (Cirque du Soleil)*. Las Vegas, NV 2006
- *Siggraph*. Boston, MA 2006
- *Boston Museum of Science: Seamless II Fashion Show*. Boston, MA 2006
- *Collision X*. Art Interactive, Boston, MA 2006
- *Collision VIII*. Art Interactive, Boston, MA 2005
- *Boston Cyberarts Festival*. Boston, MA 2005
- *Collision VII*. Art Interactive, Boston, MA 2005
- *Collision VI*. Art Interactive, Boston, MA 2004
- *Boston Art Windows Project*. Boston, MA 2004
- *National Design Triennial: Cooper-Hewitt Smithsonian*. New York, NY 2002-3
- *galleryFX*. Boston, MA 2001
- **Theatre and TV Experience** —
Experience on Stage and Set
 - *Time Warp - Discovery Channel*. Host. TV Show pilot focused on high-speed and alternative imaging technologies.
 - *Orpheus X - American Repertory Theatre*. Guitars and Keyboards. Original opera by Rinde Eckert, directed by Robert Woodruff. Performed at the Edinburgh International Festival. Cambridge, MA 2007
 - *Battle of the Geeks - Discovery Channel / BBC Network*. Participant. Reality TV Show pilot focused on a 48-hour inventing competition. Namibia, Africa 2006
 - *Oedipus - American Repertory Theatre*. Guitars and Keyboards. Original score by Evan Ziporyn, directed by Robert Woodruff. Cambridge, MA 2007
- **Invited Talks** —
Robotics and Arts Talks, and Invited Panels
 - *AAAI 2008: Artificial Creativity*. Chicago, IL 2008
 - *Tokion Creativity Now Conference*. New York City, New York 2008
 - *MassART Kinetic Art Symposium*. Boston, MA 2008
 - *International Conference on Robotics and Automation*. Italy, Rome 2007
 - *SigGraph*. Boston, MA 2006
 - *CollisionCollusion XXX*. Boston, MA 2004
- **Invited Reviewer** —
Reviewer for Refereed Journal and Gallery entries
 - *International Journal of Robotics Research (IJRR)*. 2006
 - *SigGraph Art Gallery*. 2006
- **Book Appearances** —
Noted work in current Literature
 - *Contemporary Art of Science and Technology*.
 - *Inside Design Now: The National Design Triennial*.
- **Magazine/Photo Appearances** —
Selected Articles and Interviews in Periodicals
 - *Tokion*. 'OK Computer' 2008
 - *Cedar Wings* (Magazine of Middle East Airlines). 'Inventions that Reinvent your Needs - the World's most original lightbulb!' 2007
 - *Improper Bostonian*. 'Fall Arts Preview' 2007
 - *Face* (Japanese Magazine). 2007
 - *PLAN - MIT Journal of Architecture and Planning*. 'PhD Student wins Mural Competition.' 2007
 - *Axis - concepts on the horizon*. 'MIT Media Lab: moving on the frontiers of design' (personal interview) 2005
 - *FHM*. High speed photo spread, 2002
 - *web.mit.edu*. Homepage image for MIT, 2004 and 2007

Skills

- **Computer Related:**

- **Operating Systems:** Any computer made after 1983.
 - **Languages:** Proficient in C, C++, Java, Perl, Tcl/Tk, Make, HTML, dHTML, CSS, L^AT_EX, Familiar with PHP, UNIX shells
 - **Hardware:** Proficient with MicroControllers [especially AVR], FPGAs, specialist in motor control and high speed control algorithms.
 - **Software:** Proficient in EagleCAD, Matlab, Mathematica, Solidworks, ProEngineer, Photoshop, Illustrator, Ableton, ProTools, Logic, Final Cut Pro, MAX/MSP
- **Tools and Systems:**
 - Proficient with Precision Machine Design, CNC Lathe, CNC Mill, Saw, Waterjet, Laser Cutter, Feedback System Design, Robotics [IK, etc], Large scale design, Multi-scale integration design.

Achievements and Activities

- *Award of Distinction - Ars Electronica.* Linz, Austria 2008
- *Gold Prize, 55th international Cannes Lions Advertising Festival.* Cannes, 2008
- *Silver Pencil, One Show Interactive, best New Media Innovation and Development.* US, 2008
- *Silver Egg, Guldagget, best Internet campaign.* Sweden, 2008
- *Creativity Magazine's most creative advertising campaign of March 2008.* US, 2008
- *MIT Student Mural Design Competition.* Cambridge, MA 2007
- *Philip Lowe Memorial Award for Creative Achievements in Music.* Cambridge, MA 2000
- *National honors in the Putnam mathematics Competition.* 1999
- Over 500 international blog articles written about my work.
- I once boxed Muhammed Ali in an elevator, but he won.