

# ADAM KUMPF

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CREATIVE PROBLEM SOLVER, PROTOTYPER, ENGINEER, DESIGNER

## EDUCATION

### **Master of Science in Media Arts and Sciences – 2009**

Massachusetts Institute of Technology, Media Lab

Thesis: *Trackmate: Large-Scale Accessibility of Tangible User Interfaces*

Group: Tangible Media Group, led by Hiroshi Ishii

### **Master of Engineering in Electrical Engineering and Computer Science – 2007**

Massachusetts Institute of Technology, CSAIL

Thesis: *Explorations in Low-Cost Compliant Robotics*

Group: Humanoid Robotics Group, led by Rodney Brooks

### **Bachelor of Science in Electrical Engineering and Computer Science – 2005**

Massachusetts Institute of Technology

## EXPERIENCE

### **MIT Media Lab, Tangible Media Group – June 2007 to August 2009**

Research Assistant working with Prof. Hiroshi Ishii on ways to make Tangible User Interfaces (TUI) more accessible. Developed Trackmate, a low-cost, easy-to-build, do-it-yourself tabletop tangible interface; LusidOSC, an open source communication protocol supporting unique spatial input devices via Open Sound Control; and FretNot, a guitar-based instrument designed to study the effects of physical constraints on musical composition and improvisation.

### **MIT CSAIL, Humanoid Robotics Group – June to December 2006**

Research Assistant working with Prof. Rodney Brooks on low-cost compliant robotics. Focused on iterative design of robotic parts that exploit the trade-off between mechanical precision and computational modeling of those components. Created an inexpensive alternative for series compliant actuation, the Torsionally Compliant Elastomer Joint.

### **MIT Department of Electrical Engineering – August 2005 to June 2006**

Teaching Assistant for 6.101 (MIT's analog electronics laboratory) and 6.190 (an experimental laboratory class for radio frequency design). Received the Harold L. Hazen Teaching Award for teaching excellence.

### **MIT Computer Science and Artificial Intelligence Laboratory (CSAIL) – June to August 2005**

Observed current forms of compliant robotic manipulation, brainstormed new actuation and manufacturing methods, and prototyped dozens of configurations to explore the design space. Conceived, developed, and built a new form of elongation actuation, the Elacoil, and methods for fiber-optic force sensing. Prototyped extensively via 3D modeling, shape deposition manufacturing, casting, milling, lathing, and lasercutting.

### **Motorola – Advanced Concepts Group (R&D) – June to August 2004**

Helped develop and implement new form factors and interfaces for mobile communications devices. Designed, built, and tested multiple microcontroller, networking, interface, and control circuits. Worked on two projects simultaneously; both led to patent reviews, and one led to a U.S. patent (US# 7,433,649). Innovated daily alongside product designers and engineers in a rapid prototyping environment.

### **MIT Laboratory for Electromagnetic and Electronic Systems (LEES) – June to August 2003**

Designed, built, and tested PCBs for 3-axis magnetic sensing under 3-phase power lines and then back-solved to find the currents within each wire (part of the Non-Intrusive Load Monitoring project). Prototyped a new electronic lab kit with a built-in vehicle to be used by MIT electrical engineering classes. Designed and constructed Ozone generation boards used to study the flow of air in buildings. Developed new techniques for Power Line Carrier Modem communication across transformers.

### **MIT Media Lab, Future of Learning Group – June to August 2002**

Designed circuits to be used as learning tools for teachers in developing countries. PCBs were then built, tested, and used in the field (including microcontroller integration with both the PIC and the MSP430). Taught a group of over 150 to use the GoGo and Espion learning tools—and the Logo programming language—during a two-week workshop in Curitiba, Brazil.

## INTERESTS

I enjoy creative problem solving, designing user interfaces, prototyping, building mechanical objects, playing the guitar, brainstorming, hacking hardware, sketching, meta-level thinking, programming (Java, Javascript, Perl, C++, Assembly, Scheme), philosophizing about open source, circuitry (analog, digital, and system-level design), photography, rock climbing, juggling, 3D CAD, adventurous cooking, mathematical system modeling, AVR/PIC microcontroller programming, sculpting stone, wordplay, and questioning questions.