Lillian Chin

http://lillych.in · (404)-561-9619 · ltchin@mit.edu

Education

Massachusetts Institute of Technology (MIT) **2017 - 2022 (expected)**
PhD in Electrical Engineering and Computer Science *Cambridge, MA*

Massachusetts Institute of Technology (MIT) **June 2017**
B.S. in Electrical Engineering and Computer Science *Cambridge, MA*
Minors in Mechanical Engineering, Comparative Media Studies *GPA: 4.9/5.0*

Research Experience

MIT Computer Science & Artifical Intelligence Lab., Distributed Robotics Group **Sept. 2016 – present**
Researcher with Dr. Daniela Rus *Cambridge, MA*

- Designed electricaly-powered soft robotic actuator based on chiral shear auxetic patterns
- Mechanically characterized force output and compliance of actuator, creating biomimetic fingers and tentacles

Toyota Research Institute **June – Aug. 2017**
Robotics Intern *Cambridge, MA*

- Designed automated mechanical testing rigs to evaluate performance of new soft tactile sensor against simulation
- Created new silicone-based tactile skin and performed experiments on mechanical adhesion and accuracy
- Explored current tactile sensing solutions - contacting manufacturers and recreating academic prototypes

Massachusetts Institute of Technology, Department of Mechanical Engineering **2014 – 2017**
Researcher with Dr. John Hart *Cambridge, MA*

- Created machine vision algorithms in C++ for dynamic photolithography system, increasing speed of tracking, detection and encapsulation by 300% with multithreading, Kalman filters and bit plane splicing.
- Performed encapsulation experiments on liver hepatocytes in photopolymers for tissue engineering applications.
- Adapted photolithographic system to a robot arm, enabling accurate micropatterning on macro-scale objects. Improved scanning system's accuracy and designed mechanical enclosures for electronic / optical systems.
- Designed and printed NFC circuits to test capabilities of photolithography system for flexible circuits
- Analyzed performance of various particle detection and tracking algorithms in simulated and actual conditions.

MIT Media Lab, Biomechatronics Group **2015**
Researcher with Dr. Hugh Herr *Cambridge, MA*

- Created thin-wire electrodes and Matlab script to stimulate rat sciatic nerve and measure response
- Wrote automated particle analysis in ImageJ to measure neuron size, count and g-ratio to quantify nerve regrowth

MIT Computer Science and Artifical Intelligence Laboratory, Big Data Initiative **2014**
Researcher with Dr. Sam Madden *Cambridge, MA*

- Strengthened Django and Javascript frameworks of a system that allowed users to control data privacy and access
- Created REST API for the personal data storage system, enabling interfacing with iOS and Android sensors

Georgia Institute of Technology, Department of Mechanical Engineering **2011 – 2013**
Researcher with Dr. Michael Leamy *Atlanta, GA*

- Constructed an agent-based model in NetLogo to study collective cell movement during wound healing.
- Innovatively applied engineering principles to create model based on biological time-lapse videos of wound healing.

Emory University, Department of Pharmacology **2011 – 2013**
Researcher with Dr. Jennifer Hurst-Kennedy *Atlanta, GA*

- Conducted cell invasion and cell-migration assays to study the role of a deubiquitnating enzyme in cancer metastasis.
- Established a method for quantitative analysis of cell invasion data taken from time-lapse confocal video microscopy.

Westminster Schools **2010 – 2013**
Researcher with Dr. Chris Harrow and Dr. Shaffiq Welji *Atlanta, GA*

- Investigated locus of a conic sections foci using dynamic geometry and computer algebra software
- Analyzed behavior found by applying projective and algebraic geometry to the problem.

Work Experience

Apple **2016**
iPad Hardware Systems Integration, Electrical Engineering Intern *Cupertino, CA*

- Designed schematic and PCB in Cadence for internal project board involving high-speed signals.
- Wrote TCL scripts to validate functionality of SoCs. Deployed this test suite on SMT, FATP and REL lines in China.
- Performed power validation and signal integrity measurements on low and high speed signals, including I2C and SPI.
- Wrote scripts in Lua, C++ and Python for internal eye diagram measurements & thermal experiments on battery life.

Square **2015**
Electrical Engineering Intern *San Francisco, CA*

- Wrote C code for NFC card proximity detection that interfaced with 2 microcontrollers, an FPGA, ADC/DACs, and a voltage regulator. Key part of firmware needed to pass contactless payment certification
- Tuned NFC antennas with VNA and SMT rework skills, enabling proposal of new antenna design directions
- Wrote Python script to send HCI commands to Bluetooth chip, validating results with spectrum analyzer
- Supported EVT build in China, conducting failure analysis for SMT and FATP factory lines and providing translation
- Created preliminary schematics and PCB layout for new NFC board in Altium

Projects

For pictures and more detailed information, please go to `http://lillych.in`

2.72 - Elements of Machine Design **2016**
Desktop lathe that maintained 50 micron precision even after being dropped. Won first place for highest accuracy

MIT Mobile Autonomous Systems Laboratory **2016**
Cube-stacking autonomous robot. Won first place, best software, best wiki and "most likely to be staff" award

MakeMIT **2014**
Guitar-playing robot that uses solenoids to strum and a rack-and-pinion setup to fret. Won first place.

Teaching Experience

Teacher, MIT Educational Studies Program **2013 – present**
Taught several one-shot classes on math, games and linguistics in Splash 2013 and 2015, a 3-day program for high school students. Taught 7-week long humanities classes for middle school and high school students for HSSP 2014, 2015, and 2017

Head Lab Assistant, 6.002 - Circuits and Electronics **2015 – 2017**
Guided students to a better understanding of circuits by helping them debug their lab circuits, from basic ADCs to audio amplifiers. Organized and scheduled 8 different Lab Assistants, helping them with their duties by giving weekly lab tips

Tutor, InstaEDU / Chegg Tutors **2014 – 2017**
Tutored online with 97% positive reviews in many subjects, including math, AP US History, Physics, Computer Science

Lab Assistant, 6.004 - Computation Structures **2016**
Guided students to a better understanding of digital circuits from the transistor level to creating their own basic CPU

Mentor, Girls Who Code **2015**
Led workshop on hardware and robotics to 20 high school girls to inspire them to pursue engineering. Provided one-on-one mentorship, giving advice on college, being assertive and staying interested in engineering

Awards and Honors

Jeopardy College Championship **2017**
Won first place out of 15 contestants on nationally televised Jeopardy competition.

Burchard Scholar **2016**
One of 35 students chosen from MIT for demonstrated excellence in the humanities

Kleiner Perkins Caulfield Byers (KPCB) Engineering Fellow **2014**
One of 50 students selected nationally for a fellowship to develop technical skills & connect with entrepeneurial leaders.

Intel Science Talent Search Finalist **2013**
One of forty finalists recognized in national science research competition for original research in bioengineering.

Publications

1. Stevens, A., Oliver, R., Kirchmeyer, M., Wu, J., **Chin, L.**, Polsen E., Archer, C., Boyle, C., Garber, J., and Hart, J. (2016). Conformal robotic stereolithography. *3D Printing and Additive Manufacturing*, 3(4): 226-235.
2. Harrow, C. and **Chin, L.** (2014). Technology-Enhanced Discovery. *Mathematics Teacher*, **107**: 660 665.