Lillian Chin

http://lillych.in · (404)-561-9619 · ltchin@mit.edu · 3 Ames Street, Cambridge, MA 02142

Education

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*

Westminster Schools **May 2013**
High School Diploma *Atlanta, GA*
Salutatorian *GPA: 101.77/100*

Work Experience

Apple **June – Aug. 2016**
iPad Hardware Systems Integration, Electrical Engineering Intern *Cupertino, CA*

- Designed schematic layout and PCB board in Cadence for internal project board involving high-speed signals.
- Wrote TCL scripts to validate basic functionality on primary SoCs. Deployed and supported this test suite at stations on SMT, FATP and REL lines in China.
- Performed and debugged power validation and signal integrity measurements on low and high speed signals, including SPI, I2C, and PCIe.
- Brought up and performed failure analysis on boards and full systems, working cross-functionally among product design and module teams
- Conducted thermal experiments on battery life and power output. Wrote Python scripts for data analysis and visualization, suggesting testing and board design changes based on results.
- Wrote scripts in Lua and C++ to take internal eye diagram measurements of high-speed signal lines.

Square **June – Aug. 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 of 300 units in China with electrical engineeirng, embedded software and translation skills for SMT and FATP factory lines
- Provided foundation for algorithm to automatically design tamper mesh in Altium
- Created preliminary schematics and PCB layout for new NFC board in Altium

Coursera **June – Aug. 2014**
Software Engineering Intern *Mountain View, CA*

- Wrote Javascript for on-demand certification, moving Coursera's major revenue generator to an updated platform.
- Restructured large portion of backend logic in PHP and Django for Coursera's shift to single certification and trials.
- Created internal analytics dashboard in AngularJS to monitor status of product and revenue generated.

Research Experience

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

- Designed chiral shear auxetic pattern in aluminum capable of creating load-bearing structures, including bridges.
- Characterized living hinge joints for aluminum through waterjetting samples and analysis of plastic living hinges
- Will be designing a self-deploying robot that uses the auxetic material for actuating foldable rigid joints.

Massachusetts Institute of Technology, Department of Mechanical Engineering **Feb. 2014 – present**
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 **Jan – May 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 and differentiate neuron size, count and g-ratio to quantify nerve regrowth

MIT Computer Science and Artifical Intelligence Laboratory, Big Data Initiative **Sept. – Dec. 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 **May 2011 – Aug. 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 **Aug. 2011 – May 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 **Jan. 2010 – May 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.

Projects

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

2.75 - Medical Device Design **Fall 2016**
Created forceps with rotational and sensing capabilities for operative vaginal delivery. Also made wooden kinematic coupled tea set

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

2.671 - Measurement and Instrumentation **Spring 2016**
Investigated how different ingredient composition affects the texture profile of cookies. Presented work at MIT Open House with MIT Energy Initiative

MIT Mobile Autonomous Systems Laboratory **Jan. 2016**
Cube-stacking autonomous robot with wall-bouncing, vision tracking and color detection algorithms. Won first place, best software, best wiki and "most likely to be staff" award

6.131 - Power Electronics Laboratory **Fall 2015**
Portable audio equalizer with LED visualization

2.008 - Design and Manufacturing II **Fall 2015**
Fifty injection-molded and thermoformed yoyos with personally designed molds

6.115 - Microcontroller Project Laboratory **Spring 2015**
Simple virtual reality maze game with pressure and light sensors

MakeMIT 2015 **Feb. 2015**
Programmable gantry painter for easy ceiling tile painting

DerpSkates **Jan. 2015**
Easily strappable roller skates. Project for XFair 2015

MIT Security Survey **Sept. - Apr. 2015**
Research and activism to protest changes to dorm security. Met with President and Chancellor of MIT and worked with student dorm governments to conduct research

2.00 - Introduction to Design **Spring 2014**
Product design - sleeping bag jacket for a bikepacker. Also, foam core balloon-popping device for a competition

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

Battlecode **Jan. 2014**
AI to compete in real-time strategy game

HackMIT **Nov. 2013**
Travelive - a trip-planning website that looks at the predicted weather for your route and suggests appropriate activities

AP Computer Science AI Competitions **Spring 2013**
AIs that can compete in Iterated Prisoner's Dilemma and Tron

FIRST Robotics **2010 - 2013**
4 internationally ranked robots that won 3 regionals

Leadership Experience

MIT Undergrad. Association: Student-Administration Collaboration Committee **May 2015 - present**
Chair *Cambridge, MA*

- Expanded committee scope to entire institute, gaining Chancellor, faculty and administrator support
- Collaborated with several administrators and faculty, including Chancellor and department heads to improve transparency and timeliness of communications
- Coordinated efforts of 10 person undergraduate committee to effectively research current student-admin interactions, create recommendations for communications, and run student-admin events / mixers

Free Fossils MIT **Apr. 2014 - present**
President and Founder *Cambridge, MA*

- Organized study breaks and trips to local museums as part of paleontology interest group

MIT Medlinks **Oct. 2013 - present**
Member *Cambridge, MA*

- Support fellow dorm residents' health by providing first aid medication, confidential conversations, and connection to MIT Medical resources

Society of Women Engineers **Sept. 2013 - present**
Member *Cambridge, MA*

- Mentored 30 middle school and high school girls through Women in Science and Engineering (WISE), exposing them to various STEM fields
- Selected for scholarship to attend Grace Hopper Conference in 2014

Westminster Robotics Teams **Jan. 2010 – May 2013**
Team Captain, Lead Coder and Founder *Atlanta, GA*

- Manufactured parts using Solidworks and CNC mill as member of internationally-ranked robotics team
- Constructed efficient vision-tracking autonomous mode in Java and C++; scored 50% of team's points.

Teaching Experience

6.004 - Computation Structures **Sept. 2016 – present**
Lab Assistant *Cambridge, MA*

- Guided students to a better understanding of digital circuits from the transistor level to creating their own basic CPU to assembly language

6.002 - Circuits and Electronics **Sept. 2015 – present**
Head Lab Assistant *Cambridge, MA*

- 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

InstaEDU / Chegg Tutors **Oct. 2014 – present**
Tutor *Cambridge, MA*

- Tutored online with 97% positive reviews in many subjects, including mathematics, AP US History, AP English, Physics, Computer Science and College Admissions

MIT Educational Studies Program **Nov. 2013 – present**
Teacher *Cambridge, MA*

- Taught several one-shot classes on math, games and linguistics in Splash 2013 and 2015, a 3-day program for high school students
- Taught several 7-week long humanities classes for middle school and high school, including one on modernist literature for HSSP 2014 and 2015.

Girls Who Code **June – Aug. 2015**
Mentor *San Francisco, CA*

- 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

Epsilon Camp **June – Aug. 2014**
Counselor *Mountain View, CA*

- Taught and mentored 47 elementary school campers at an advanced mathematics residential camp
- Tutored campers in number theory and geometry, and mediated interpersonal disputes
- Led parent workshop on inspiring girls to pursue STEM fields

Westminster Mu Alpha Theta Chapter **Aug. 2010 – May 2013**
President / Vice-President *Atlanta, GA*

- Organized math competitions and tutoring network as part of a national mathematics honor society
- Co-founded Math and Science Club in conjunction with tutoring program at locla elementary school

Atlanta Math Circle **Sept. 2010 – May 2011**
Co-founder *Atlanta, GA*

- Taught interested middle school students about mathematics not commonly taught in schools, such as combinatorics and series.

Publications

1. Stevens, A., Oliver, R., Kirchmeyer, M., Wu, J., **Chin, L.**, Polsen E., Archer, C., Boyle, C., Garber, J., and Hart, J. (In Press). Conformal robotic stereolithography. *3D Printing and Additive Manufacturing*.
2. Oliver, R., **Chin, L.**, and Hart, J. (2016). Novel System for Dynamic Lithography. Manuscript in Preparation.
3. Oliver, R., Lewandowski, J., **Chin, L.**, and Hart, J. (2016). Efficient real-time detection and tracking of particles and cells in microfluidic channel and at an interface. Manuscript in Preparation.
4. Harrow, C. and **Chin, L.** (2014). Technology-Enhanced Discovery. *Mathematics Teacher*, **107**: 660 665.
5. **Chin, L.** (2013). Creating a Computer Model to Study Wound Healing. $E = mc^2$*: A High School Mathematical Science Journal*, May issue.

Honors and Awards

Tau Beta Pi Society **2016 - 2017**
National Engineering Honors Society, chosen for exemplary character and distinguished scholarship

Eta Kappa Nu Society **2016 - 2017**
National Honor Society for Electrical Engineering and Computer Science, chosen for being in the top third of the EECS class and community service to EECS department

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

Winner of MIT Mobile Autonomous Systems Laboratory **Jan. 2016**
Won first place, best software, best wiki and most likely to be staff for our cube-stacking autonomous robot

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

Winner of MakeMIT Hackathon **Jan. 2014**
Awarded first place for creating prototype of guitar-playing robot in 14 hours including strumming and fretting mechanism.

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

NCWIT Award for Aspirations in Computing **2011, 2012, 2013**
National Runner Up and Georgia Affiliate Winner for leadership and aptitute in computing

Skills and Activities

Laboratory – Basic cell-culture techniques, time-lapse video & confocal microscopy, machine shop experience, CNC mill, CNC lathe, surface mount soldering rework experience

Languages – *Fluent:* Python, Java, C/C++, LaTeX, Matlab, NetLogo, TCL; *Familiar:* Javascript, SQL, HTML/CSS, PHP, Bash, Chinese, Lua

Proficiencies – Git, ImageJ, Adobe Photoshop, Adobe Illustrator, Nikon Elements, Django, Jenkins, EAGLE, Altium, MasterCAM, Solidworks, Cadence

Clubs – Tech Squares, MIT Sporting Clays Association, Assassin's Guild