# Lillian Chin

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## 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 for internal 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.
- 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 and suggested testing and board design changes based on results.

**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

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

**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

**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 and create recommendations

**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

**6.002 - Circuits and Electronics**  Sept. 2015 – present
*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

**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. Oliver, R., **Chin, L.**, and Hart, J. (2016). Novel System for Dynamic Lithography. Manuscript in Preparation.
2. 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.
3. Harrow, C. and **Chin, L.** (2014). Technology-Enhanced Discovery. *Mathematics Teacher*, **107**: 660 665.
4. **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

**Burchard Scholar**                                                                 **2016 - 2017**
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
**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