

# LILLIAN CHIN

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## EDUCATION

<b>Massachusetts Institute of Technology (MIT)</b> <i>PhD in Electrical Engineering and Computer Science</i>	<b>2017 - 2022 (expected)</b> <i>Cambridge, MA</i>
<b>Massachusetts Institute of Technology (MIT)</b> <i>B.S. in Electrical Engineering and Computer Science</i> <i>Minors in Mechanical Engineering, Comparative Media Studies</i>	<b>June 2017</b> <i>Cambridge, MA</i> <i>GPA: 4.9/5.0</i>

## RESEARCH EXPERIENCE

<b>MIT Computer Science &amp; Artificial Intelligence Lab., Distributed Robotics Group</b> <i>Researcher with Dr. Daniela Rus</i>	<b>Sept. 2016 – present</b> <i>Cambridge, MA</i>
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- Designed electrically-powered soft robotic actuator based on chiral shear auxetic patterns
- Mechanically characterized force output and compliance of actuator, creating biomimetic fingers and tentacles

<b>Toyota Research Institute</b> <i>Robotics Intern</i>	<b>June – Aug. 2017</b> <i>Cambridge, MA</i>
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- 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

<b>Massachusetts Institute of Technology, Department of Mechanical Engineering</b> <i>Researcher with Dr. John Hart</i>	<b>2014 – 2017</b> <i>Cambridge, MA</i>
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- 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.

<b>MIT Media Lab, Biomechatronics Group</b> <i>Researcher with Dr. Hugh Herr</i>	<b>2015</b> <i>Cambridge, MA</i>
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- 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

<b>MIT Computer Science and Artificial Intelligence Laboratory, Big Data Initiative</b> <i>Researcher with Dr. Sam Madden</i>	<b>2014</b> <i>Cambridge, MA</i>
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- 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

<b>Georgia Institute of Technology, Department of Mechanical Engineering</b> <i>Researcher with Dr. Michael Leamy</i>	<b>2011 – 2013</b> <i>Atlanta, GA</i>
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- 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.

<b>Emory University, Department of Pharmacology</b> <i>Researcher with Dr. Jennifer Hurst-Kennedy</i>	<b>2011 – 2013</b> <i>Atlanta, GA</i>
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- Conducted cell invasion and cell-migration assays to study the role of a deubiquitinating enzyme in cancer metastasis.
- Established a method for quantitative analysis of cell invasion data taken from time-lapse confocal video microscopy.

<b>Westminster Schools</b> <i>Researcher with Dr. Chris Harrow and Dr. Shaffiq Welji</i>	<b>2010 – 2013</b> <i>Atlanta, GA</i>
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- 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

<b>Apple</b> <i>iPad Hardware Systems Integration, Electrical Engineering Intern</i>	<b>2016</b> <i>Cupertino, CA</i>
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- 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

*Electrical Engineering Intern*

**2015**

*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

### Mentor and Library Machine Master, MIT MakerWorkshop

**2017 – present**

Served as peer mentor for student-run machine shop, teaching and supporting the mechanical engineering community. Expanded the library tool-check out program with how-to-build classes and maintaining existing toolkits

### Teacher, MIT Educational Studies Program

**2013 – present**

Taught several 1-day & 7-week long classes on math, games, literature, and linguistics for 6th - 12th grade students

### 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 and provided one-on-one mentorship

## 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 entrepreneurial 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.