Lillian Chin

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Academic Positions

University of Texas, Austin (UT Austin) — **2024 - present**
Assistant Professor of Electrical and Computer Engineering — *Austin, TX*

National Institutes of Health (NIH) — **2023 - 2024**
Postdoctoral Fellow, Advisors: Leonardo Cohen, Tom Bulea — *Bethesda, MD*

Education

Massachusetts Institute of Technology (MIT) — **2017 - 2023**
PhD in Electrical Engineering and Computer Science, Advisor: Daniela Rus — *Cambridge, MA*
Thesis: "Function Follows Form: An Exploration of Robotic Embodiment through Geometry" — *GPA: 4.8/5.0*

Massachusetts Institute of Technology (MIT) — **2017 - 2019**
S.M. in Electrical Engineering and Computer Science, Advisor: Daniela Rus — *Cambridge, MA*
Thesis: "A High-Deformation Electric Soft Robotic Gripper via Handed Shearing Auxetics" — *GPA: 4.8/5.0*

Massachusetts Institute of Technology (MIT) — **2013 - 2017**
B.S. in Electrical Engineering and Computer Science — *Cambridge, MA*
Minors in Mechanical Engineering, Comparative Media Studies — *GPA: 4.9/5.0*

Honors and Awards

Research Awards

Winner ($5,000) (2 selected, institution) – Dimitris N. Chorafas Award	**2023**
Winning Team ($100,000) – Norman B. Leventhal City Prize	**2022**
Nominated, Best Paper [J.5] – IEEE Robosoft Conference	**2021**
First Place ($1,000) – MIT Research Slam	**2020**
Best Poster Award [C.3] – IEEE Robosoft Conference	**2019**
First Place, Student Paper Competition [W.3] – ACM Symposium on CS & Law	**2019**
Finalist (40 selected, nationally) – Intel Science Talent Search	**2013**

Fellowships

Fellow (32 selected, internationally) – Schmidt Science Fellows	**2023 – 2024**
Fellow (10 selected, nationally) – Hertz Foundation Graduate Fellowship	**2018 – 2023**
Scholar (55 selected, institution) – MIT Social and Ethical Responsibilities of Computing (SERC) Scholar	**2021 – 2023**
Fellow (2,000 selected, nationally) – National Science Foundation Graduate Research Fellowship	**2018 – 2021**
Fellow (40 selected, nationally among first-gen immigrants) – Paul & Daisy Soros Fell. for New Americans	**2018 – 2020**
Fellow (25 selected, institution) – MIT Energy Initiative Graduate Fellowship	**2018**
Fellow (75 selected, nationally) – Kleiner Perkins Caulfield Byers (KPCB) Engineering Fellow	**2014**

Personal Awards

Participant (85 selected, internationally among EECS academics w. underrepresented genders) – EECS Rising Stars	**2022**
Participant (70 selected, nationally among underrepresented engineering academics) – NextProf Nexus	**2022**
Participant (30 selected, internationally among robotics researchers) – Robotics, Science & Systems (RSS) Pioneers	**2022**
First Place ($10) – Topsfield County Fair, Crafts Department, Original Needlework	**2022**
Member (75 selected, institution) – Phi Beta Kappa Honors Society, Xi Chapter	**2017**
First Place ($100,000) – Jeopardy College Championship Winner	**2017**

Publications

Peer-Reviewed Journal Articles

[J.12] **Chin, L.**, Lipton J., Xie, G., & Rus, D. "AuxSwarm: A Compliant Cellular Material with Electroactive Voxel-Level Control through Modular Auxetic Robots." Manuscript in preparation.

[J.11] Xie, G., Holladay, R.*, **Chin, L.***, & Rus, D. "In-Hand Manipulation with a Simple Belted Parallel-Jaw Gripper." *IEEE Robotics and Automation Letters* 9(2), 1334-1341. (2024)

[J.10] **Chin, L.**, Burns, M.*, Xie, G.*, & Rus, D. "Flipper-Style Locomotion through Strong Expanding Modular Robots." *IEEE Robotics and Automation Letters.* 8(2), 528-535. (2022) Presented at ICRA 2023.

[J.9] Truby, R.*, **Chin, L.***, Zhang, A., & Rus, D. "Fluidic Innervation Sensorizes Structures from a Single Build Material." ***Science Advances***. 8(31). (2022)

[J.8] Zhang, A., Truby, R., **Chin, L.**, Li, S., & Rus, D. "Vision-Based Sensing for Electrically-Driven Soft Actuators." *IEEE Robotics and Automation Letters.* 7(4): 11509-11516. (2022) Presented at IROS 2022.

[J.7] Araki, B., Choi, J., **Chin, L.**, Li, X., & Rus, D. "Learning Policies by Learning Rules." *IEEE Robotics and Automation Letters.* 7(2): 1284-1291. (2021)

[J.6] **Chin, L.** "How to Survive a Public Faming: Understanding 'The Spiciest Memelord' via the Temporal Dynamics of Involuntary Celebrification." *First Monday.* 26(4). (2021)

[J.5] Spielberg, A.*, Amini, A.*, **Chin, L.**, Matusik, W., & Rus, D. "Co-Learning of Task and Sensor Placement for Soft Robotics." *IEEE Robotics and Automation Letters.* 6(2): 1208-1215. (2021) **Nominated, Best Paper Award** at Robosoft 2021.

[J.4] Truby, R.*, **Chin, L.***, & Rus, D. "A Recipe for Electrically-Driven Soft Robots via 3D Printed Handed Shearing Auxetics." *IEEE Robotics and Automation Letters.* 6(2): 795-802. (2021) Presented at Robosoft 2021.

[J.3] Lipton, J., MacCurdy, R., Manchester, Z., **Chin, L.**, Celluci, D., & Rus, D. "Handedness in Shearing Auxetics Creates Rigid and Compliant Structures." ***Science***. 360(6389): 632-635. (2018)

[J.2] Stevens, A., Oliver, R., Kirchmeyer, M., Wu, J., **Chin, L.**, Polsen E., Archer, C., Boyle, C., Garber, J., & Hart, J. "Conformal robotic stereolithography." *3D Printing and Additive Manufacturing*, 3(4): 226-235. (2016)

[J.1] Harrow, C. & **Chin, L.** "Technology-Enhanced Discovery." *Mathematics Teacher*, **107**: 660 – 665. (2014)

Peer-Reviewed Conference Papers

[C.11] Chen, V.*, **Chin, L.***, Choi, J.*, Zhang, A.*, & Rus, D. "Online Packing of Groceries Through Soft Fingers with Integrated Visual-Tactile Sensing." Manuscript under review for Robosoft 2024.

[C.10] Zhang, A.*, **Chin, L.***, Tong, D.L., & Rus, D. "Embedded Air Channels Transform Soft Lattices into Sensorized Grippers." Manuscript under review for ICRA 2024.

[C.9] Xie, G., **Chin, L.**, Kim, B., Holladay, R., & Rus, D. "Strong Compliant Grasps through a Cable-Driven Soft Robotic Gripper." Manuscript under review for ICRA 2024.

[C.8] Zhang, A.*, Wang, T.-H.*, Truby, R., **Chin, L.**, & Rus, D. "Machine Learning Best Practices for Soft Robot Proprioception." In *Intelligent Robots and Systems (IROS), 2023 IEEE International Conference on.* IEEE. (2023).

[C.7] Stölzle, M., **Chin, L.**, Truby, R., Rus, D., & Della Santina, C. "Modelling Handed Shearing Auxetics: Selective Piecewise Constant Strain Kinematics and Dynamic Simulation." In *Soft Robotics (Robosoft), 2023 IEEE International Conference on.* IEEE. (2023).

[C.6] **Chin, L.**, Barscevicius, F., Lipton, J., & Rus, D. "Multiplexed Manipulation: Versatile Multimodal Grasping via a Hybrid Soft Gripper." In *Robotics and Automation (ICRA), 2020 IEEE International Conference on.* IEEE. (2020).

[C.5] Lipton, J., **Chin, L.**, Miske, J., & Rus, D. "Modular Volumetric Actuators Using Motorized Auxetics." In *Intelligent Robots and Systems (IROS), 2019 IEEE International Conference on.* IEEE. (2019).

[C.4] **Chin, L.**, Yuen, M.C., Lipton, J., Trueba, L.H., Kramer-Bottiglio, R., & Rus, D. "A Simple Electric Soft Robotic Gripper with High-Deformation Haptic Feedback." In *Robotics and Automation (ICRA), 2019 IEEE International Conference on.* IEEE. (2019).

[C.3] **Chin, L.**, Lipton, J., Yuen, M.C., Kramer-Bottiglio, R., & Rus, D. "Automated Recycling Separation Enabled by Soft Robotic Material Classification." In *Soft Robotics (Robosoft), 2019 IEEE International Conference on.* IEEE. (2019). **Winner, Best Poster Award**

[C.2] **Chin, L.**, Lipton, J., MacCurdy, R., Romanishin, J., Sharma, C., & Rus, D. "Compliant Electric Acutators Based on Handed Shearing Auxetics." In *Soft Robotics (Robosoft), 2018 IEEE International Conference on.* IEEE. (2018).

[C.1] Beaudoin J., **Chin L.**, Zlotnick H., Cervantes T., Lassey S., Robinson J., & Slocum A. "Obstetrical Forceps with Passive Rotation and Sensor Feedback." ASME. Frontiers in Biomedical Devices, *2018 Design of Medical Devices Conference.* (2018).

Patents

[P.2] Rus, D., Lipton, J., & **Chin, L.** "Vibration absorber for power tools", US11,583,972, issued on Feb. 21, 2023.

[P.1] Lipton, J., MacCurdy, R., **Chin, L.**, & Rus, D. "Non-planar shearing auxetic structures, devices, and methods", US10,850,406, issued on Dec. 1, 2020.

Workshop and Symposium Contributions

[W.3] **Chin, L.** "Focusing the Legal Lens on Data: Examining Metaphors of Personal Data and their Legal Implications " Paper and poster in 2019 ACM Inaugural Symposium on Computer Science and Law
First Prize, Student Paper Competition

[W.2] **Chin, L.** "Design and fabrication of dual-flipping mechanisms." Abstract and poster in 2019 International Conference on Robotics and Automation workshop: *Robot Design and Customization: Opportunities at the Intersection of Computation and Digital Fabrication*

[W.1] **Chin, L.**, Lipton, J., MacCurdy, R., Romanishin, J., Sharma, C., & Rus, D. "Compliant Electric Acutators Based on Handed Shearing Auxetics." Poster in 2018 New England Manipulation Symposium

TEACHING EXPERIENCE – ACADEMIC

CMS.701 - Current Debates in Media
Teaching Assistant

2020
Cambridge, MA

- Led discussions on technology and society for a class of 15 senior undergraduate students.
- Managed transition from in-person to online teaching due to the COVID-19 pandemic.

MIT Mobile Autonomous Systems Laboratory
Teaching Assistant

2018
Cambridge, MA

- One of 7 undergraduate TAs who led this completely student-run course to design an autonomous robot with computer vision in a month.
- Staffed lab for 30 undergraduates, providing mechanical, electrical and programming guidance to 30 undergraduates in a time-constrained environment.

6.002 - Circuits and Electronics
Head Lab Assistant

$2015 - 2017$
Cambridge, MA

- Staffed lab for 60-85 undergraduates, guiding 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 overviews

6.004 - Computation Structures
Lab Assistant

2016
Cambridge, MA

- Staffed lab for 300 undergraduates, guiding students to a better understanding of digital circuits from the transistor level to creating their own basic CPU in assembly language

TEACHING EXPERIENCE – PEDAGOGICAL TRAINING

MIT Kaufman Teaching Certificate Program 2022
Participant *Cambridge, MA*
- Participated in semester-long teaching training program, learning evidence-based teaching techniques to create effective lessons and inclusive classrooms.

MIT EECS UROP Mentorship Initiative 2022
Focus Group Member *Cambridge, MA*
- Acted as semester-long beta tester for graduate student intiative to develop new guidelines for undergraduate research mentorship

TEACHING EXPERIENCE – OUTSIDE OF CLASSROOM

Mentorship

Mentor, Project SHORT	**2021 − 2023**
Mentor, MIT EECS Graduate Application Assistance Program	**2020**
Mentor, Cientifico Latino Graduate Student Mentorship Initiative	**2018 − 2020**
Mentor, MIT Society of Women Engineers Alumni Mentorship Program	**2018 − 2020**
Mentor, MIT Office of Minority Education, Laureates and Leaders Program	**2018 − 2020**
Mentor, MIT Women in Electrical Engineering and Computer Science	**2018 − 2020**
Mentor, Girls Who Code	**2015**
Mentor, Society of Women Engineers	**2014**

Extracurricular

Tutor, ESL Program for MIT Facilities Department Employees	**2019 − 2020, 2022 − 2023**
Mentor and Library Machine Master, MIT MakerWorkshop	**2017 − 2020**
Teacher, MIT Educational Studies Program	**2013 − 2019**
Tutor, InstaEDU / Chegg Tutors	**2014 − 2017**

PROFESSIONAL SERVICE

Conference and Society Service

Associate Co-Chair, IEEE RAS Technical Committee on Mechanisms and Design	**2023 − present**
Program Committee Chair, RSS Pioneers	**2023**
Local Arrangements Chair, ACM Symposium on Computational Fabrication	**2018**

External Paper Reviewer

IEEE Robotics and Automation Magazine (RA-M)	**2023**
First Monday	**2020 − 2021, 2023**
IEEE Robotics and Automation Letters (RA-L)	**2019 − 2023**
IEEE International Conference on Robotics and Automation (ICRA)	**2019 − 2020, 2022 − 2024**
IEEE International Conference on Soft Robotics (Robosoft)	**2018 − 2021, 2023, 2024**
IEEE International Conference on Intelligent Robots and Systems (IROS)	**2019, 2021, 2022**
IEEE International Conference on Automation Science and Engineering (CASE)	**2021**
International Journal of Robotics Research (IJRR)	**2019**

Invited Speaker
Talk: "Materials Make the Bot: Directly Embedding Actuation and Perception into Robotic Structures"

Queen's University at Kingston, Centre for Neuroscience Studies Talk	**Jun. 2023**
UC Berkeley, Mechanical Engineering Seminar	**Mar. 2023**
UT Austin, Electrical and Computer Engineering Seminar	**Mar. 2023**
Oregon State, Mechanical Engineering Seminar	**Feb. 2023**
Carnegie Mellon, Softbotics Seminar	**Nov. 2022**
Georgia Tech, Mechanical Engineering Seminar	**Oct. 2022**

UMass Boston, Dept. of Psychology, Class on Research Methods – "Repeated Measures"	**June 2023**
Hertz Summer Workshop – "Sensorizing Architected Materials with Fluidic Networks"	**Jul. 2022**
CUNY Queens College, Media Studies Colloquium – "How To Survive a Public Faming"	**Nov. 2021**

Hertz Fall Retreat – Panel Leader, "Robotics"	**Sep. 2020**
University of Copenhagen SURF@DAWN – "Embodied Intelligence"	**Jul. 2020**
Consumer Electronics Expo – Panelist, "Robots Save the Land"	**Jan. 2020**
Hertz East Coast Retreat – Panelist, "Science and Media"	**Sep. 2018**
Designed Education – Speaker, "Introduction to Robotics"	**Jul. 2018**

Professional Societies: IEEE, IEEE RAS

RESEARCH STUDENTS SUPERVISED

Masters Students

Gregory Xie [**J.10, J.11, J.12, C.9**, thesis] – *Design of sensorized soft gripper and belt-driven gripper*	**2022 − 2023**
Jeana Choi [**J.7, C.11**, thesis] – *System integration of grocery packing robot*	**2020 − 2022**

Undergraduate Students

Juliana Covarrubias – *Mechanical design of dual-flipping robots*	**2022 − 2023**
Shruti Garg – *System integration of sensorized fingers and design of tactile sensors*	**2022 − 2023**
Katherine Pan – *Mathematical exploration of dual-flipping robots*	**2022 − 2023**
Grey Saramiento – *Algorithmic lattice generation and routing of fluidic sensors*	**2022 − 2023**
Daniel Tong [**C.10**] – *Exploration of resin chemistry and metamaterial design through nTopology*	**2022 − 2023**
Max Burns [**J.10**] – *Application exploration of modular volumetric robots*	**2022**
Nine Morch – *Design testing rigs for metamaterials; mechanical design of dual-flipping robots*	**2022**
Ahmed Diongue – *Mechanical characterization of metamaterials*	**2022**
Valerie Chen [**C.11**] – *Computer vision algorithms for bin packing; tactile sensor design*	**2019 − 2022**
Gregory Xie [**J.10, J.12**] – *System design of modular volumetric robots*	**2019 − 2021**
Joaquin Giraldo-Laguna – *Fabrication and simulation of modular volumetric robots*	**2020**
Sofia Leon – *Mechanical design of dual-flipping robots*	**2019 − 2020**
Hannah Adams – *Mechanical characterization of metamaterials*	**2019**
Felipe Barscevicius [**C.6**] – *Mechanical design of multiplexed manipulator*	**2019**
Andromeda Teevens – *Exploration of machine learning segmentation algorithms*	**2019**
Sabina Tontici – *Mechanical design of soft robotic gripper*	**2019**
Chetan Sharma [**C.2**]– *Mechanical design of soft robotic gripper covering*	**2017 − 2019**
Shiloh Curtis – *Exploration of computer vision segmentation algorithms*	**2018 − 2019**
Jacob Miske [**C.5**] – *System design of modular volumetric robots*	**2018 − 2019**
Jonathan Tagoe – *Design testing rigs for metamaterial characterization*	**2018 − 2019**
Antares McCoy-Villaneda – *Design testing rigs for metamaterial characterization*	**2018**
Luis Trueba [**C.4**] – *Grasping tests and mechanical design of grocery packing testbed*	**2018**