ERIC T. CHANG

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EDUCATION

Columbia University, New York, NY **expected 2026**
Ph.D. in Mechanical Engineering, advisor: Matei Ciocarlie

Duke University, Durham, NC **Spring 2021**
B.S.E. in Mechanical Engineering, B.A. in Computer Science GPA: 3.97/4.00
Magna Cum Laude, Graduation With Distinction

Universidad Carlos III de Madrid, Madrid, Spain **Fall 2019 (study abroad)**

RESEARCH AND PROJECT EXPERIENCE

ROAM Lab, Columbia University **Fall 2021 - Present**
Ph.D. Student, advisor: Matei Ciocarlie

- Research interests: tactile sensing, dexterous manipulation, embodied intelligence, mat. sci. for robotics
- Taking courses in robotics, control, dynamics, mechatronics, statistics, machine learning, reinforcement learning, robot learning

Mitzi Research Group, Duke University **Spring 2018 - Spring 2021**
Research Assistant, advisor: David Mitzi

- Conducted independent research project investigating chalcogenides for solar devices in a search for cost effective, earth abundant solar materials, culminating in a senior thesis examining bournonite as an energy material
- First authored paper on chalcogenide band gap engineering (under review)
- Explored band gap engineering, thin-film processing, and device fabrication of bournonite, analyzing structure and optical properties of bulk and thin-film samples
- Selected for funding from competitive Dean's Research Fellowship and Pratt Fellows research program

Duke Robotics, Duke University **Spring 2018 - Spring 2021**
Task Planning Lead, Mechanical Engineer
Project: Design autonomous underwater vehicle for and compete in International RoboSub Competition

- Designed and implemented task planning architecture for autonomous navigation in competition (Python)
- Designed, prototyped, and tested servo-controlled torpedo launcher (iterative design, Solidworks)
- Designed and tested Delrin thruster supports using 3D CAD (SolidWorks) and structural analysis (FEA)
- Placed 1st of 54 in technical report, 1st in propulsion, 3rd in sensor optimization (2021 virtual competition)

UC3M Robotics Lab, Madrid, Spain **Fall 2019**
Research Assistant, advisor: Alberto Jardón Huete

- Developed VR game prototype for patient wrist movement rehabilitation (Unity3D, C#, LeapMotion)

INDUSTRY EXPERIENCE

Houston Mechatronics Inc., Houston, TX **Summer 2021**
Robotics R&D Intern, manager: John Yamokoski
Project: Refine point cloud compression algorithms for underwater untethered data transmission

- Investigated optimizations for compressing point cloud data from TOF, structured light, and lidar sensors with compression ratio > 300 (C++, Python, ROS, Docker)

Realtime Robotics, Boston, MA   **Summer 2020**
Mechanical and Applications Engineering Intern, manager: Nathan Koontz
Project: Develop test cell for application of company's motion planning technology to spot welding cells

- Designed and prototyped scaled spot-welding gun and work cell for testing for a major customer (OnShape)
- Wrote software to control robots and weld guns for multi-robot motion planning demo (Python, Arduino)
- Collected industry data for team on industrial robot models and associated applications
- Assessed and presented on company applications and potential in e-commerce and logistics sector

Coherix, Ann Arbor, MI   **Summer 2019**
Product Development Intern
Project: Improve robot programming methods in automotive manufacturing

- Improved potential plant efficiency by 25 minutes per part through development of machine vision software to self-correct manually programmed nozzle position of an adhesive-dispensing robot
- Created 3D animations for program testing and presentation using the MayaVi Python package
- Co-presented program demo on industrial robot to full team of 20 individuals, including company executives

VOLUNTEER EXPERIENCE

Girls Science Day, New York, NY   **Fall 2021**
Experiment Leader

- Created and led Arduino activity for middle school students as an introduction to circuits and programming

Duke String School Youth Symphony, Durham, NC   **Spring 2020**
Percussionist

- Played for spring concert and faculty fundraiser concert, raising over $2000 for student scholarships

Real Colegio Nuestra Señora de Loreto, Madrid, Spain   **Fall 2019**
Elementary Teaching Assistant

- Volunteered twice a week in elementary English classes during my semester abroad

GRID Alternatives, Salinas, CA   **Spring 2019**
Construction Volunteer

- Installed solar power system in Salinas at no cost to the homeowner; discussed climate justice, green farming, and heard first hand of system owners' experiences

CET Academic Programs/Duke Engage, Quang Tri, Vietnam   **Summer 2018**
Teaching and Construction Volunteer

- Participated in highly selective, 8-week, immersive service learning project funded by Duke University
- Co-taught an English class of thirty 10th graders, preparing and implementing daily lessons and activities
- Constructed a basketball court with Vietnamese university students, Duke students, and local community members, while communicating across a language barrier
- Co-organized culture show for the community, including performances by over 300 students

AWARDS AND HONORS

- NASA Graduate Research Fellowship (NSTGRO) (2022)
- Oscar and Vera Byron Fellowship, Columbia Fu Foundation School of Eng. and Applied Science (2021)
- Raymond C. Gaugler Award in Materials Science & Engineering, Duke Pratt School of Engineering (2021)
- Best Poster Award, Materials Research Society 2021 Virtual Spring Conference (2021)
- Symposium Award (2nd place), Materials Research Society 2021 Virtual Spring Conference (2021)

- Tau Beta Pi Engineering Honors Society (Treasurer), Duke Pratt School of Engineering (2019 - 2021)
- Pi Tau Sigma Mechanical Engineering Honors Society, Duke Pratt School of Engineering (2019 - 2021)
- Pratt Research Fellowship, Duke Pratt School of Engineering (2020)
- Dean's Undergraduate Research Fellowship, Duke Undergraduate Research Support Office (2020)

PUBLICATIONS AND PRESENTATIONS

Publications

- **Eric Chang***, Gabrielle Koknat*, Garrett Mckeown Wessler, Yi Yao, Volker Vlum, David B. Mitzi. "Phase Stability, Bandgap Tuning and Rashba Splitting in Selenium-Alloyed Bournonite." *Under Review*, 2022
- I am an author on a paper in preparation on developing a transparent and mechanically realistic kidney phantom as a research platform for laser lithotripsy studies. PI: Dr. Pei Zhong
- 2021 RoboSub Technical Design Report: E. Jiang, N. Chakraborty, M. Arivoli et al., "CTHULHU: The Design and Implementation of the Duke Robotics Club's 2021 RoboSub Competition Entry," RoboSub: San Diego, USA, 2021. https://robonation.org/app/uploads/sites/4/2021/07/RoboSub_2021_Duke_TDR.pdf
Placed 1st of 54 in technical design report portion of competition
- 2020 RoboSub Technical Design Report: S. Rabinowitz, E. Jiang, N. Chakraborty et al., "CTHULHU: The Design and Implementation of the Duke Robotics Club's 2020 RoboSub Competition Entry," RoboSub: San Diego, USA, 2020. https://robonation.org/app/uploads/sites/4/2020/08/RS20_TDR_Duke.pdf
Placed 4th of 33 in technical design report portion of competition
- 2019 RoboSub Technical Design Report: S. Rabinowitz, E. Chang, D. Miron et al., "CTHULHU: The Design and Implementation of Duke Robotics Club's 2019 AUVSI Competition Entry," RoboSub: San Diego, USA, 2019. https://robonation.org/app/uploads/sites/4/2019/10/Duke_RS19_TDR.pdf

Presentations

- "Synthesis and Characterization of Selenium-Alloyed Bournonite CuPbSb(S$_{1-x}$Se$_x$)$_3$: a Prospective Semiconductor for Optoelectronic Applications." May 2021. Oral presentation. Senior thesis presentation to graduate with distinction.
- "Synthesis and Characterization of Selenium-Alloyed Bournonite CuPbSb(S$_{1-x}$Se$_x$)$_3$: a Prospective Semiconductor for Optoelectronic Applications." April 2021. Poster presentation. Visible Thinking (Duke's undergraduate research fair).
- "Synthesis and Characterization of Selenium-Alloyed Bournonite CuPbSb(S$_{1-x}$Se$_x$)$_3$: a Prospective Semiconductor for Optoelectronic Applications." March 2021. Poster presentation. Materials Research Society 2021 Virtual Spring Conference.
Won best poster award and placed 2nd in symposium award.