ERIC T. CHANG

website: ricandrobots.com

EDUCATION

Columbia University, New York, NY — **expected 2026**
Ph.D. in Mechanical Engineering (in 3$^{\text{rd}}$ year), advisor: Matei Ciocarlie
M.S. in Mechanical Engineering (Fall 2022)   GPA: 4.03/4.00
NASA Graduate Research Fellow (NSTGRO)

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

RESEARCH EXPERIENCE

R.O.A.M. Lab, Columbia University — **Fall 2021 - Present**
Ph.D. Candidate, advisor: Matei Ciocarlie

- Designing multimodal tactile fingers for dexterous manipulation
- Took courses in robotics, control, dynamics, mechatronics, machine learning, robot learning
- Research interests: tactile sensing, dexterous manipulation, mat. sci. for robotics

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

- First authored paper on bournonite band gap engineering, working to develop solar materials and devices that are cost effective and sustainable

Duke Robotics Club, 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 (Python); designed, prototyped, and tested servo-controlled torpedo launcher (iterative design, Solidworks)

INDUSTRY EXPERIENCE

Nauticus Robotics (formerly Houston Mechatronics), 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)

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 (Python)

AWARDS AND HONORS

- TIME's Best Inventions of 2023 for RSS paper led by Gagan Khandate (2023)
- 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

- **E.T. Chang***, R. Wang*, P. Ballentine, J. Xu, T. Smith, B. Coltin, I. Kymissis, M. Ciocarlie, "An Investigation of Multi-feature Extraction and Super-resolution with Fast Microphone Arrays," *under review at ICRA 2024.* https://arxiv.org/abs/2310.00206
- G. Khandate*, S. Shang*, **E.T. Chang**, T.L. Saidi, J. Adams, M. Ciocarlie, "Sampling-based Exploration for Reinforcement Learning of Dexterous Manipulation," *Robotics: Science and Systems* **2023**. https://arxiv.org/abs/2303.03486
  Named to TIME's Best Inventions of 2023
- **E.T. Chang**, G. Koknat, G.C. McKeown Wessler, Y. Yao, V. Blum, D.B. Mitzi, "Phase Stability, Band Gap Tuning, and Rashba Splitting in Selenium-Alloyed Bournonite: $CuPbSb(S_{1-x}Se_x)_3$," *Chemistry of Materials* **2023** *35*, 595-608. https://doi.org/10.1021/acs.chemmater.2c03109
- S. Tran, J. Chen, G. Kozel, **E.T. Chang**, et al., "Development of an optically transparent kidney model for laser lithotripsy research," *BJU International* **2023**. https://doi.org/10.1111/bju.16015
- Duke RoboSub Team, "CTHULHU: The Design and Implementation of the Duke Robotics Club's 2019/2020/2021 RoboSub Competition Entry," RoboSub: San Diego, USA, 2019/2020/2021.
  https://robonation.org/app/uploads/sites/4/2019/10/Duke_RS19_TDR.pdf
  https://robonation.org/app/uploads/sites/4/2020/08/RS20_TDR_Duke.pdf
  https://robonation.org/app/uploads/sites/4/2021/07/RoboSub_2021_Duke_TDR.pdf
  Placed 1st (4th) of 54 (33) in technical design report portion of 2021 (2020) competition

Presentations and Workshop Papers

- **E.T. Chang**, P. Ballentine, I. Kymissis, M. Ciocarlie, "Towards Development of a Signal-Dense Multimodal Tactile Finger," June 2023. Extended abstract and poster presentation. ICRA 2023 ViTac Workshop.
- **E.T. Chang**, G. Koknat, V. Blum, D.B. Mitzi, "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.