CHAO LI (CHARLIE)

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https://chaoli-charlie.github.io/ **|** https://scholar.google.com/citations?user=s1_pmEIAAAAJ

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA **Expected 2027**
PhD in Electrical Engineering and Computer Science

Massachusetts Institute of Technology, Cambridge, MA **June 2024**
M.S in Electrical Engineering and Computer Science, GPA: 5.00/5.00
PhD in Electrical Engineering and Computer Science

Carnegie Mellon University (CMU), Pittsburgh, PA ***May 2022***
B.S in Electrical and Computer Engineering, GPA: 4.00/4.00
College of Engineering (CIT) College Honors
University Honors

PUBLICATIONS

Journal Articles

1. Chao Li, Krishna Pranav, Monica Coenraads, Lieberman, David, Jana Von Hehn, Randall Carpenter, Coughlin, Michelle, Dina Katabi. "Uncovering Sleep and Respiratory Biomarkers in Rett Syndrome via Passive At-Home Monitoring" *In Preparation for Submission* (2024)

2. Chao Li, Hao He, Dina Katabi. "Assessing Sleep in Pediatric Populations from nocturnal breathing signals" *In Preparation for Submission* (2024)

3. May Inn Sim, Dickson Thian, Ramu Maddu, Xiaoye Chen, Hang Khume Tan, Chao Li, Pin Ho, Anjan Soumyanarayanan. "Zero Field Antiferromagnetically Coupled Skyrmions and their Field-Driven Uncoupling in Composite Chiral Multilayers" *In submission to Advanced Functional Materials*

4. He Hao*, Chao Li*, Wolfgang Ganglberger, Kaileigh Gallagher, Rumen Hristov, Michail Ouroutzoglou, Haoqi Sun, Jimeng Sun, M. Brandon Westover, and Dina Katabi. "What Radio Waves Tell Us about Sleep!" *Sleep* (2024): zsae187 (*co-first author) ***Selected for an editorial***

5. Balagopal Unnikrishnan, Cuong Nguyen, Shafa Balaram, Chao Li, Chuan Sheng Foo, Pavitra Krishnaswamy. "Semi-supervised classification of radiology images with NoTeacher: A teacher that is not mean", In Medical Image Analysis, Volume 73, 2021, 102148, ISSN 1361-8415, https://doi.org/10.1016/j.media.2021.102148

Conference Proceedings

1. Jones, Nicholas, Joshua Wornell, Chao Li, and Eytan Modiano. "Achieving AoI Fairness in Spatially Distributed Wireless Networks: From Theory to Implementation." 2024 22nd International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt)

2. Chao Li, Nancy Pollard, "SoftTouch: A Sensor-Placement Framework for Soft Robotic Hands." 2022 IEEE-RAS 21st International Conference on Humanoid Robots (Humanoids), Ginowan, Japan, 2022, pp. 504-511, doi: 10.1109/Humanoids53995.2022.10000138.

3. Akarsh Prabhakara, Diana Zhang, Chao Li, Sirajum Munir, Aswin Sankanaryanan, Anthony Rowe, Swarun Kumar, "Exploring mmWave Radar and Camera Fusion for High-Resolution and Long-Range Depth Imaging." 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, 2022, pp. 3995-4002, doi: 10.1109/IROS47612.2022.9982080.

4. Coulson, Ryan, Chao Li, Carmel Majidi, and Nancy S. Pollard. "The Elliott and Connolly Benchmark: A Test for Evaluating the In-Hand Dexterity of Robot Hands." 2020 IEEE-RAS 20th International Conference on Humanoid Robots (Humanoids), pp. 238-245. IEEE, 2021. ***Finalist in IEEE Humanoids Best Interactive Paper Award***

TALKS

"SoftTouch: A Sensor Placement Framework for Soft Robotic Hands", C. Li, N. Pollard, Meeting of the Minds 2022, Carnegie Mellon University

"Stabilization of zero-field skyrmions in synthetic antiferromagnetic multilayers", M. I. Sim, D. Thian, X. Chen, P. Ho, H. K. Tan, C. Li, R. Maddu, G. Sarjoosing, N. C. B Lim, S. K. Y. Lee, A. Soumyanarayanan, APS March Meeting Meeting 2021

"The Elliott and Connolly Benchmark: A Test for Evaluating the In-Hand Dexterity of Robot Hands", C. Li, R. Coulson, C. Majidi, N. Pollard, Meeting of the Minds 2021, Carnegie Mellon University

"The Elliott and Connolly Benchmark: A Test for Evaluating the In-Hand Dexterity of Robot Hands", R. Coulson, C. Li, C. Majidi and N. S. Pollard, 2020 IEEE-RAS 20th International Conference on Humanoid Robots (Humanoids), 2021

AWARDS

Wellcome Trust Fellow '23 **Jan 2024**
Department of Electrical Engineering and Computer Science

E.M. Williams Award
Department of Electrical and Computer Engineering, Carnegie Mellon University **May 2022**

University Honors
Carnegie Mellon University **May 2022**

Honors in Research **May 2022**
College of Engineering, Carnegie Mellon University

Small Undergraduate Research Grants (SURG) **Aug 2021**
Carnegie Mellon University, Undergraduate Research Office

Finalist in IEEE Humanoids Best Interactive Paper Award **Jul 2021**

Highest Scorer in Engineering Category **May 2021**
Meeting of the Minds, Sigma Xi Poster Competition, Carnegie Mellon University

Summer Undergraduate Research Fellowship (SURF) **Apr 2021**
Carnegie Mellon University, Undergraduate Research Office

Dean's List for Academic Performance **All Semesters**
College of Engineering, Carnegie Mellon University

Outstanding Chapter Award, Eta Kappa Nu (HKN) Sigma Chapter **2019-2020**

RESEARCH EXPERIENCE

PhD Candidate **Aug 2022 -**
Computer Science and Artificial Intelligence Laboratory (CSAIL), MIT ***Advised by Professor Dina Katabi***

- Developed methods to train machine learning models that ensure fair and accurate predictions across diverse patient demographics and medical conditions
- Designed biomarkers based on gait and sleep patterns to track the progression of neurological disorders, including Rett Syndrome and Parkinson's Disease
- Creating a real-time machine learning system that uses auditory stimulation to enhance sleep through predictive modeling

Wireless Technology Research Assistant ***Aug 2021 – May 2022***
Electrical and Computer Engineering, Carnegie Mellon University ***Advised by Professor Swarun Kumar***

- Developed the high-resolution and long-range depth imaging Metamoran camera-radar fusion system
- Camera-Radar pipeline classifies objects at far range and in high clutter environments with range information, at a higher accuracy compared to the image segmentation Detectron
- Opensourced our range-image ground truth lidar, camera and raw I/Q radar dataset

Robotics Research Assistant ***Oct 2019 – Jul 2022***

Robotics Institute, Carnegie Mellon University ***Advised by Professor Nancy Pollard***

- Developed the first quantitative-qualitative benchmark for dexterous manipulation of robotic hands
- My benchmark evaluates translation and rotation dexterity of a series of dexterous manipulations
- Built the CMU Foam Hand III, a low DOF Soft Robotic Hand highly dexterous fully soft hand design
- Developed a sensor placement framework for dexterous manipulation for non-andromorphic hand designs (Pending Conference Submission)
- Designed a multisensory contact system to classify different manipulation failures

Deep Learning Research Intern ***Jun 2020 – Jul 2021***

*Institute for Infocomm Research, A*STAR, Singapore* ***Advised by Dr Foo Chuan Sheng***

- Developed the semi-supervised learning (SSL) model, NoTeacher, that outperformed established SSL methods with minimal hyperparamter tuning
- The NoTeacher model achieved over 90-95% AUROC score with less than 5-15% labelling budget as compared to a fully supervised model with 100% labelling budget
- The NoTeacher model outperforms a fully supervised model in highly class imbalance medical datasets such as the NIH Chest X-Ray dataset and RSNA Brain dataset

Embedded Systems Intern ***May 2020 – Jun 2020***

Electrical and Computer Engineering Department, NUS ***Advised by Professor John Ho***

- Collaborated with UI/UX designer to build custom made medical device website, and research engineers to integrate Raspberry Pi with Blinkt! LEDs using JavaScript
- Website was introduced to migrant workers in Singapore to teach them how to record and report their oximeter readings to their health supervisors

Magnetic Storage Research Intern ***Apr 2019 – Aug 2019***

*Institute for Material Research and Engineering, A*STAR* ***Advised by Professor Anjan Soumyanarayanan***

- Designed multilayer stack to host stable magnetic skyrmions at zero magnetic fields for application in racetrack memory devices

Classical Machine Learning Research Intern ***Jan 2019 – Mar 2019***

Electrical and Computer Engineering Department, NUS ***Advised by Professor Thomas Yeo***

- Discovered that Classical Machine Learning models are more accurate in predicting fluid intelligence as compared to Deep Learning models due to the high dimensional fMRI of the Human Connectome Project Dataset