JIAHE CHEN

PHD CANDIDATE IN ELECTRICAL ENGINEERING

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PROFILE

I am a 4th-year PhD student studying robotics in the Electrical and Computer Engineering department at Cornell University. I am highly competent in mathematical modeling, multi-agent simulation, and data analysis, and have extensive experience in electronics design and computer programming. I am enthusiastic about robotics engineering and I am seeking for an internship where I can apply my skills to work on cutting-edge robotic systems and solve high-impact problems in the industry.

EDUCATION

PhD in Electrical Engineering
Cornell University | Ithaca, NY, US **May 2024**

- GPA: 3.82/4.30

MSE in Electrical Engineering
University of Pennsylvania | Philadelphia, PA, US **May 2019**

- GPA: 3.97/4.00
- Thesis: A Closed-Loop Neurostimulation System for Energy-Efficient Electrical Stimulations

BASc in Engineering Physics
Queen's University | Kingston, ON, Canada **May 2017**

- First Class Honours
- Thesis: The Design of a Comprehensive Measurement System for the Proton Beam Target

SKILLS

Technical:
Mathematica, MATLAB, scikit-learn, Altium, Cadence, LabVIEW, AutoCAD, ROS, Microsoft Office

Skills:
Stochastic Modeling, Multi-Agent Simulation, Machine Learning, Data Analysis, Integrated Circuits Design, Printed Circuit Board Design, Embedded System

Programming Language:
Python, C++, C, Verilog

RESEARCH EXPERIENCE

Research Assistant
Collective Embodied Intelligence Lab, Cornell University **Sep 2019 - Present**

Advised by Prof. Kirstin Petersen

- Study collectve robotic construction (CRC) systems where a group of robots collaboratively build structures much larger than themselves.
- Developed a stochastic model for analyzing the construction duration and efficiency of a distributed CRC system.
- Developed an agent-based simulator for studying the error effects in CRC systems and proposed a stochastic distributed algorithm for automatically correcting the errors in the system.
- Designed a fully customized programmable wireless power transfer system for charging multiple modular robots powered by Li-ion batteries.

Research Assistant
Electronic Photonic Microsystems Lab, University of Pennsylvania **Jan 2018 - Jun 2019**

Advised by Prof. Firooz Aflatouni and Prof. Jan Van der Spiegel

- Participated in the design and implementation of an implantable chip that can classify neural signal in real time by using an unsupervised machine learning algorithm.
- Designed a low-power integrated circuits system for converting raw neural signal to high-resolution digital signal.
- Designed and implemented an implantable chip that can detect the minimum electric current for effective neurostimulation.

Undergraduate Researcher
Reactor Materials Testing Laboratory, Queen's University May 2016 - Jun 2017

Advised by Prof. Mark Daymond

- Designed and implemented a high-precision instrumentation system for measuring the current and accumulated charges on the metal sample irradiated by a beam of accelerated protons.

HONORS & AWARDS

Jacobs Fellowship
Cornell University Aug 2020 & Aug 2021

Merit-Based Fellowship
Cornell University Aug 2019

Outstanding Academic Award: Honorable Mention
University of Pennsylvania May 2019

Dean's Scholar
Queen's University May 2015 & May 2017

Excellence Scholarship
Queen's University Sep 2013

PUBLICATIONS

Smarticle 2.0: Design of Scalable, Entangled Smart Matter
Distributed Autonomous Robotic Systems (DARS) Jul 2022
Danna Ma, **Jiahe Chen**, Sadie Cutler, and Kirstin Petersen

Decay-Based Error Correction in Collective Robotic Construction
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Jun 2022
Jiahe Chen, and Kirstin Petersen

Errors in Collective Robotic Construction
Distributed Autonomous Robotic Systems (DARS) Jan 2022
Jiahe Chen, Yifang Liu, Adam Pacheck, Hadas Kress-Gazit, Nils Napp, and Kirstin Petersen

A 10.8 μW Neural Signal Recorder and Processor With Unsupervised Analog Classifier for Spike Sorting
IEEE Transactions on Biomedical Circuits and Systems Apr 2021
Han Hao, **Jiahe Chen**, Andrew G. Richardson, Jan Van der Spiegel, and Firooz Aflatouni

TEACHING EXPERIENCE

Head Teaching Assistant
College of Engineering, Cornell University Aug 2022 - Dec 2022

- ECE/ENGRD 2300 Digital Logic & Computer Organization

Graduate Teaching Assistant
School of Engineering and Applied Science, University of Pennsylvania Sep 2018 - May 2019

- ESE 568 Mixed Signal Design and Modeling
- ESE 570 Digital Integrated Circuits and VLSI-Fundamentals

LEADERSHIP EXPERIENCE

President
Cornell Chinese Christian Fellowship Feb 2020 - Feb 2021

MEMBERSHIPS & AFFILIATIONS

Student Member
Institute of Electrical and Electronics Engineers Mar 2019 - Present

Member
Cornell Computer Systems Laboratory Student Steering Committee Mar 2021 - Mar 2022