Jiawei Chen

chenjw@umich.edu
United States Citizen

Education

University of Michigan, Ann Arbor, MI

Robotics PhD, advised by Jean-Baptiste Jeannin (3.892/4.0 GPA) **Expected May 2025**

- Coursework: Formal Verification, Autonomous Vehicles, Hybrid Systems, Programming Languages
- NSF GRFP Honorable Mention

Robotics MS (3.892/4.0 GPA) **May 2022**

Indiana University, Bloomington, IN

Dual Major: Bachelor of Arts in Computer Science and Physics (4.0/4.0 GPA) **August 2016 - May 2020**

- Mathematics Minor
- Graduation with Highest Distinction (3.9+ GPA) **May 2020**

Research Experience

University of Michigan

Graduate Student Research Assistant (Jean-Baptiste Jeannin, Karem Sakallah) **August 2020 - Present**

- Developing a robotics platform enabling executable, formally-verified software for embedded systems
- Formalizing a refinement type system for synchronous programming languages based on Lustre
- Implemented a real-time message-passing protocol for connecting synchronous programs to low-level drivers for controlling robot sensors and actuators
- Demonstrated safety of formally-verified autonomous vehicle braking implemented in a synchronous language on real robots
- Mentored a total of ten undergraduates since 2021
- Evaluating performance of Quantitative Semantics for Signal Temporal Logic in MATLAB/Simulink
- Using High-Performance Computing to benchmark and classify Boolean Satisfiability Solvers

Indiana University

Undergraduate Research Assistant (Geoffrey Brown, Adam Fudickar) **July 2017 - August 2020**

- Developed and published a simulation-based validation method for animal activity logging
- Assisted in development, test, and fabrication of sub-1μA accelerometer loggers collecting over 100,000 hours of data across 7 experiments

Publications

Chen J, Vargas de Mendonça JL, Ayele B, Bekele B, Jalili S, Sharma P, Wohlfeil N, Zhang Y, Jeannin J. Synchronous Programming and Refinement Types. *Submitted.*

Brown GM, **Chen J**, Fudickar AM, Jahn AE. 2023. An Open-Source Platform for Sub-g, Sub-μA Data Loggers. *Animal Biotelemetry* 11, 19. 2023. https://doi.org/10.1186/s40317-023-00327-0.

Chen J, Vargas de Mendonça JL, Jalili S, Ayele B, Bekele B, Qu Z, Sharma P, Shiferaw T, Zhang Y, Jeannin J. Synchronous Programming and Refinement Types in Robotics: From Verification to Implementation. *FTSCS 2022 Workshop.* https://doi.org/10.1145/3563822.3568015

Jeannin J-B, **Chen J,** Vargas de Mendonça J L, Mamouras K. Work-in-Progress: Towards a Theory of Robust Quantitative Semantics for Signal Temporal Logic. *EMSOFT 2022.*

Chen J, Brown G, Fudickar AM. 2021. Simulation-Based Validation of Activity Logger Data for Animal Behavior Studies. *Animal Biotelemetry* 9, 31. 2021. https://doi.org/10.1186/s40317-021-00254-y.

Presentations

Chen J, Jalili S, Vargas de Mendonça J L, Jeannin J-B. A Robotics Programming Language with Compile-Time Formal Verification. Oral Presentation at: 2021 University of Michigan Engineering Research Symposium; Ann Arbor, Michigan. **Research Proposal Award: Honorable Mention**

Chen J, Brown G, Fudickar AM. 2019. Validation and Simulation of Accelerometer-Based Activity Loggers. Oral presentation at: 2019 Indiana University Undergraduate Research Conference; Bloomington, Indiana.

Chen J, Himebaugh B. 2016. Up in the Air: Ground Effect of Propellers and Altitude. Oral Presentation at: 2016 Indiana University Undergraduate Research Conference; Bloomington, Indiana.

Teaching Experience

University of Michigan, Ann Arbor, MI

Graduate Student Instructor - Advanced Programming Languages **Fall 2022**

Graduate Student Instructor - Fundamentals of Aerospace Computing **Fall 2021**

Indiana University, Bloomington, IN

Undergraduate Instructor - Honors Discrete Structures **Winter 2018**

Service and Outreach

- Mentor for the African Undergraduate Research Adventure (AURA) Program 2021-present
- FIRST Alumni and Mentors Network at Michigan (FAMNM) Volunteer Coordinator 2021-present
- Robotics Outreach Ambassador 2022
- IEEE Transactions on Robotics (T-RO) Reviewer 2022
- Robotics Graduate Student Council (RGSC) Outreach Co-Chair 2022
- POPL 2021 Student Volunteer 2021
- Indiana University Science Fest Volunteer 2019
- Mentor for the Burmese-American Community Institute 2018

Skills

- Small UAS hobbyist with experience designing and flying 3D-printed and modular unmanned aircraft
- MATLAB, Simulink, OCaml, C (including embedded C), LCM, Python, Bash
- Electronics and PCB Design, Git, 3D Printing, Linux