

Chris Johannsen

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Technical Interests

- ▷ Formal verification of real-time safety-critical systems
- ▷ Application of abstract interpretation for verifiably correct programs
- ▷ Symbolic and explicit state model checking

Education

- 2022 - **Iowa State University**
Ph.D. in Computer Science, Advisor: Kristin Y. Rozier
- 2017 - 2021 **Iowa State University**
B.S. in Computer Engineering and Philosophy, GPA: 3.92

Employment

- 1/18 - **Research Assistant, Iowa State University, Laboratory for Temporal Logic**
Assisted in development of R2U2: a runtime verification tool designed for real-time safety critical systems.
Led the 16 member, interdisciplinary OpenUAS project aimed at providing an open source platform for an unmanned fixed wing aircraft.
- 6/19 - **Grader, Iowa State University, Department of Aerospace Engineering**
Applied Formal Methods, Computational Techniques for Aerospace Design
- 5/21 - 8/21 **Formal Verification Intern, Mentor Graphics (Siemens EDA)**
Developed an abstract interpretation engine which was used to more efficiently generate models of SystemC programs.
- 6/20 - 8/20 **Embedded Software Engineering Intern, Motorola Solutions Applied Technologies**
Wrote software for a localized wireless network which included a basic web and VoIP server to interact with clients all running on Raspberry Pis.
- 6/19 - 12/19 **Platform Systems Engineering Co-op, Collins Aerospace**
Assisted Cargo/Transport Systems Team with full avionics updates and testing on board aircraft including the E-3 Sentry/AWACS and C-130 for the Flight 2 System.
- 1/18 - 5/18 **Physics 1 Tutor, Iowa State University, Academic Career Services**

Related Coursework

- ▷ COM S 511: **Design and Analysis of Algorithms**, Fall 2021
- ▷ COM S 512: **Formal Methods in Software Engineering**, Spring 2021
- ▷ COM S 342: **Principles of Programming Languages**, Fall 2020

- ▷ CPR E 458: **Real Time Systems**, Fall 2020
- ▷ CPR E 381: **Computer Organization and Assembly Level Programming**, Fall 2020
- ▷ COM S 327: **Advanced Programming Techniques**, Spring 2019
- ▷ AER E 407: **Applied Formal Methods**, Fall 2018

Contributed Projects

Most projects can be found on my GitHub page at <https://github.com/cgjohannsen>

- ▷ **R2U2**
Realizable Responsive Unobtrusive Unit. Website: <http://r2u2.temporallogic.org/>
- ▷ **Magic Spin Solver**
Tool using Spin model checker to solve 3 by 3 magic squares.
- ▷ **Rogue-like Terminal Game**
Terminal based dungeon crawler game as part of COMS 327 course.
- ▷ **5 stage pipelined MIPS processor**
Basic MIPS processor implementation in VHDL as part of CPRE 381 course.
- ▷ **Uniprocessor scheduling algorithm simulator**
CLI tool to simulate RMS, DMS, EDF, and LLF scheduling algorithms as part of CPRE 458 course.
- ▷ **Simple C unit testing tool (scunit)**
Simple unit checker in C designed to be written strictly using macros within a single header file.
- ▷ **Eagle Eye Project**
Part of the Make to Innovate Program at Iowa State; Oversaw team of five members for the development of the avionics system aboard the Eagle Eye craft, an experimental Mars roving airship. Code can be found at: <https://github.com/EagleEyeisu/FlightSoftware>

Grants and Scholarships

- ▷ **NASA Cooperative Agreement for advancing the R2U2 statement of work**
Grant #80NSSC21M0121, 3/2021-7/2021, \$27,742
- ▷ **Iowa State University REU Winter 2020 Session**
Funded for research at Laboratory for Temporal Logic, 12/2020-1/2021, \$3,000
- ▷ **Iowa Space Grant Consortium NASA STEM grant**
Awarded to OpenUAS Project as Project Lead, 11/2020-5/2021, \$4,203
- ▷ **Award for Competitive Excellence**, Iowa State University
Applied to B.S., 8/2017-12/2021, \$32,000
- ▷ **Dennis Muilenburg Scholarship**, Iowa State University
Applied to B.S., 8/2017-5/2021, \$16,000

Awards and Honors

- ▷ **Eagle Scout Rank**, Boy Scouts of America, 2016
- ▷ **Phi Beta Kappa**, Member, 2021

Publications

Peer-Reviewed Conferences

- ▷ Christopher Johannsen, Marcella Anderson, William Burken, Ellie Diersen, John Edgren, Colton Glick, Stephanie Jou, Adhyaksh Kumar, John Levandowski, Evelyn Moyer, Taylor Roquet, Alexander Van-deLoo, and Kristin Yvonne Rozier. “OpenUAS Version 1.0.” In Proceedings of the 2021 IEEE International Conference on Unmanned Aircraft Systems (ICUAS), Athens, Greece (Virtual), June 15-18,2021.