

JOSHUA A. WALLIN

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Education

Northeastern University, Boston, MA

Master of Science in Computer Science

August 2019 – May 2021

GPA 3.8/4.0

Universidad Carlos III de Madrid, Madrid, ES

Exchange Student, Engineering and Humanities

January 2018 – June 2018

Iowa State University, Ames, IA

Bachelor of Science, Double Major in Computer Engineering and Spanish

August 2015 – May 2019

GPA 3.6/4.0

Honors Thesis: Benchmark Generation for Mission-Time LTL Properties via SAT and SMT

Experience

Computer Science Summer Studio, Digital Ready Inc., Boston, MA

June 2021 – July 2021

Lead Python Studio Instructor [~25 students]

- Designed and taught a month-long, full-time computer science course for underserved Boston-area high school students
- Managed a staff of six teaching assistants in all aspects of both instruction and course logistics (e.g., student transportation)
- Liaised with outside university and industry partners to provide additional learning opportunities for students

Office of Development Finance (ODF), U.S. Department of State, Virtual

September 2020 – May 2021

Virtual Student Foreign Service (VSFS) Intern

- Researched and synthesized information on the structure of the G20 under Italy's presidency to create aids for policy advisors
- Analyzed think tank events for ODF staff in compact, weekly memos to support advising and policymaking
- Compiled and summarized relevant news from international publications in English and Spanish for a weekly newsletter

Khoury College of Computer Sciences, Northeastern University, Boston, MA

September 2020 – May 2021

Graduate Teaching Assistant (CS 3800 – Theory of Computation [~100 students], CS 2800 – Logic and Computation [~150 students])

- Managed and advised a staff of seven teaching assistants as the head teaching assistant for the course (CS 3800)
- Designed and graded written and programming assignments for undergraduate students
- Held regular office hours to explain course concepts and answer student questions

Formal Methods Group, College of Computer Sciences, Northeastern University, Boston, MA

September 2019 – June 2020

Graduate Research Assistant

- Developed and implemented techniques to automatically analyze source code and deduce useful properties
- Supported the development of a tool to check the correctness of mathematical proofs submitted by students
- Modeled and scrutinized realistic systems and algorithms using software designed to create and check proofs

Trusted Systems Group, Collins Aerospace, Cedar Rapids, IA

June 2018 – September 2019

Engineering Intern

- Analyzed distributed algorithms to coordinate autonomous drone flights through modeling and rigorous proof
- Updated and maintained an internal tool ('DotArrow') to automatically check the correctness of flight control system designs
- Transitioned the 'DotArrow' tool to the flight control systems team, with support for learning and tool change requests

Laboratory for Temporal Logic, Iowa State University, Ames, IA

August 2017 – May 2019

Research Assistant

- Conceived, developed, and implemented novel algorithmic methods to test the correctness of aerospace safety systems
- Presented new research on algorithms for solving a type of temporal logic formula (Mission-Time Linear Temporal Logic)
- Led a team of students in selecting, evaluating, and modifying autopilot software to operate onboard an open-source drone

NASA Marshall Space Flight Center, Huntsville, AL

May 2017 – August 2017

Software Systems Engineering Intern

- Devised and presented a pilot project on the use of lightweight formal methods in designing the NASA Space Launch System
- Supported development and led evaluation of a data analysis tool for automatically verifying flight software correctness
- Designed and analyzed flight software tests for the NASA Space Launch System

Selected Publications & Presentations

R. Lutz, J. Lathrop, C. Brecount, K. Gast, K. Rohlfing and J. Wallin. "Using an Astronaut Jetpack Project to Teach Human-CPS Requirements Engineering," 10th International Workshop on Requirements Engineering Education and Training (REET), Zurich, Switzerland, August 2020.

J. Wallin and K.Y. Rozier. "Herra: A Prototype Tool for Online Runtime Verification Benchmark Generation," 4th International Runtime Verification Competition, November 2018. (**Received first prize in the Metric Temporal Logic Category**)

J. Wallin. "Generating System-Agnostic Runtime Verification Benchmarks from MLTL Formulas," The Tenth Midwest Verification Day(s) Workshop, September 2018.

A. Alnaqeb, Y. Li, Y. Lui, P. Pradeep, J. Wallin, C. Hu, S. Hu, and P. Wei. "Real-time Prediction of Battery Power Supply and Estimation of Future Power Demand for Electrical Rotorcraft," AIAA SciTech Forum, January 2018.

J. Wallin. "Testing, Evaluation, and Integration of a Data Analysis Tool for ES51," Intern Poster Session, NASA Marshall Space Flight Center, August 2017.