

# Andy Abigail Hammer

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## Education

- May 2029 **Ph.D. in Software Engineering**, *Carnegie Mellon University*  
Advisors: Dr. Fraser Brown, Dr. Eunsuk Kang
- May 2023 **B.S in Aerospace Engineering**, *Iowa State University*  
Minor in Computer Science  
*Magna Cum Laude*  
Research Advisor: Kristin Y. Rozier  
University Honors Program
- May 2018 **High School Diploma**  
Pleasant Valley High School  
GPA: 4.37; Graduated with Honors

## Research Experiences and Internships

- 2022 – 2023 **Software Development Intern** *Collins Aerospace, Cedar Rapids, Iowa*
- Programmed and debugged different avionics programs according to requirements
  - Detailed high level requirements according to customers' needs to create benchmarks
  - Created test procedures to ensure programs and verify systems met required benchmarks
  - Effectively communicated with coworkers to complete tasks and satisfy customer needs
- 2018 – 2023 **Undergraduate Research Assistant** *Dr. K.Y. Rozier, Iowa State University*
- Researched Formal Methods applications for Unmanned Aerial Systems
  - Co-authored industrial case-study on specification implementation for a UAS Traffic Manager
  - Lead research project on specification patterns and generation
  - Lead research project on exploitation of patterns for algorithm optimization
- May – July '21 **NASA Intern** *NASA, Ames Research Center, California*
- Debugged and located security and memory errors in advanced programs
  - Integrated static analyzer into flight software for a core flight system
  - Created trouble shooting guide to allow following programmers easy use of integrated tool
  - Analyzed compiler output and verified program success

## Teaching Experience

- 2020 – 2023 **Head Peer Mentor** *Iowa State University, Dept. Of Aerospace*
- Taught classes about campus resources and materials once per week to 10–20 students
  - Attended labs and helped students with programming and lecture materials
  - Provided timely updates and attended weekly meetings for status updates
- Feb. – Jun. '20 **Tutor for Academic Success Center** *ISU Academic Services*
- Met with 2–4 groups of students 2–3 times per week
  - Created lesson plans for each individual session
- Aug. – Dec '19 **Peer Facilitator** *Women in Science and Engineering*

- Wrote lesson plans and co-conducted lessons each week
- Attended weekly meetings to present status reports and discuss class plans
- Graded and submitted assignments and papers on a timely basis

## Grants and Awards

- Boeing Undergraduate Research Fellowship, 2021-2022
- NASA Iowa Space Grant Consortium Undergraduate Research Scholarship, 2021-2022
- Dean's List, 2018-2019, 2021-2022
- Cardinal Leadership Scholar I, 2018-2022
- President's ACE, 2018-2022

## Research Publications

- 1 Abigail Hammer, Matthew Cauwels, Benjamin Hertz, Phillip Jones, and Kristin Yvonne Rozier. "Integrating Runtime Verification into a Automated UAS Traffic Management System". In the 7<sup>th</sup> IEEE International Symposium on Systems Engineering, volume TBA, Vienna, Austria, September 13-15, 2021.
- 2 Matthew Cauwels, Abigail Hammer, Benjamin Hertz, Phillip Jones and Kristin Yvonne Rozier. "Integrating Runtime Verification into an Automated UAS Traffic Management System". In Proceedings of DETECT: international workshop on moDeLing, vErification and Testing of dEpendable CriTical systems, volume 1269, Springer, L'Aquila, Italy, September 14-18, 2020.

## Oral and Poster Presentations

- 3 Abigail Hammer and Kristin Yvonne Rozier. "Exploiting Assume-Guarantee Contract Patterns to Optimize the Discovery of Design Space Dependencies." *Iowa Space Grant Consortium Student Research Symposium*, Iowa City, Iowa, April 4, 2022.
- 4 Abigail Hammer, Matthew Cauwels, Benjamin Hertz, and Kristin Yvonne Rozier. "Implementation of Specifications onto a Runtime Verification Unit". *National Conference on Undergraduate Research (NCUR)*. Virtual, March 12-14, 2021.
- 5 Abigail Hammer, Matthew Cauwels, Benjamin Hertz, and Kristin Yvonne Rozier. "Implementing Specifications onto a Runtime Verification Unit". *Symposium on Undergraduate Research and Creative Expression*. Iowa State University, Ames, Iowa, April 29, 2020.
- 6 Abigail Hammer, Benjamin Hertz, and Kristin Yvonne Rozier. "Design and Analysis of Sensor Specification". *Spring 2019 Poster Presentation*, Iowa State University, Ames, Iowa, April 17, 2019.

## Technical Skills

- Programming Languages: Java, C, C++, Python, Ada, Matlab
- Operating Systems: Windows, Linux
- Software: Solidworks, Latex, Microsoft

## Leadership Experiences

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| 2024 – 2025 | University Leadership Student Advisory Council <ul style="list-style-type: none"> <li>• Communicated and discussed student experience at university and desired changes</li> <li>• Strategized actionable priorities to improve experience of student body</li> </ul>   |
| 2020 – 2023 | Ames Middle School First Lego League Coach: <ul style="list-style-type: none"> <li>• Introduced students to new engineering and programming concepts</li> <li>• Meet with students weekly to innovate solutions to engineering problems</li> </ul>                      |
| 2020 – 2022 | Iowa State University Undergraduate Research Ambassadors <ul style="list-style-type: none"> <li>• Worked with others to engage new students with undergraduate research</li> <li>• Lead groups to connect students with research opportunities and resources</li> </ul> |