

# RYAN HARTUNG

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## EDUCATION

### The University of Notre Dame

Ph.D. in Computer Science & Engineering

- Advisor: Dr. Douglas Thain
- Research focus: Distributed Systems and High Performance Computing

Notre Dame, IN

Expected: 2029

### The University of Notre Dame

Master of Science in Computer Science & Engineering

Notre Dame, IN

August 2025

### The University of Texas at Austin

Bachelor of Science in Physics; Computation Option

Austin, TX

May 2024

- Certificate in Elements of Computing

## TEACHING

### The University of Notre Dame

Graduate Teaching Assistant

Notre Dame, IN

August 2024 - May 2025

- TA for Elements of Computing II and Principles of Computing

## PUBLICATIONS

### 1. xGFabric: Coupling Sensor Networks and HPC Facilities with 5G Wireless Networks for Real-Time Digital Agriculture

- Authors: Liubov Kurafeeva, Alan Subedi, **Ryan Hartung**, Michael Fay, Avhishek Biswas, Shantenu Jha, Ozgur Kilic, Chandra Krintz, Andre Merzky, Douglas Thain, Mehmet Vuran, Rich Wolski
- Link: <https://doi.org/10.1145/3731599.3767589>
- Published: SC Workshops '25: Proceedings of the SC '25 Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis Pages 2317 - 2327

## TALKS/PANELS

### (2025) XLOOP Workshop at SC '25 [St. Louis, MO]

## WORK EXPERIENCE

### The University of Notre Dame

Graduate Research Assistant

Notre Dame, IN

January 2025 - Present

- Assisting with the development of [xGFabric](#) under the supervision of Dr. Thain.

### Hargrove Engineers and Constructors

Katy, TX

Controls & Automations Engineering Intern

May 2024 - August 2024

- Automated the migration of 200,000+ lines of Dow MOD5 code into Honeywell Experion without the loss of functionality
- Tracked, analyzed, and documented over 7,000 variables to design and draw comprehensive flow diagrams to visualize variable definitions
- Developed multiple algorithms to expedite the migration and variable mapping processes, improving overall efficiency

### Hargrove Engineers and Constructors

Katy, TX

Controls & Automations Engineering Intern

May 2023 - August 2023

- Instantiated existing library modules to complete the upcoming Reactor and Train configuration for Westlake's PVC plant
- Performed safety testing on all module and sequence configurations using internal procedures on simulated ABB hardware

- Successfully configured Modbus communication between the ABB and HIMA system controllers
- Updated structured text configuration to handle cross-controller communications

### The University of Texas at Austin

Undergraduate Research Assistant

Austin, Texas

June 2022 - December 2023

- Created an open-source program which leverages various Python packages to analyze star-spots patterns across multiple thousands of stars in a compressed algorithm. Ensured that the algorithm was expandable and efficient for large datasets (over 6,000 star systems)
- Compared the contrast ratio of star-spots from two different NASA missions (Kepler and TESS) to establish a basis for exoplanet identification
- Implemented parallel computing and multi-core processing to optimize runtime and compilation
- Published results to a public [GitHub repository](#)
- Funded by a NASA research grant

### LEADERSHIP AND INVOLVEMENT

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|---|-------------------------|
| • Society of Catholic Scientists  | August 2025 - Present   |
| • Science Policy Initiative at Notre Dame   | August 2025 - Present   |
| • Catholic Graduate Community   | April 2025 - Present    |
| • Technology and Catholicism Club   | February 2025 - Present |
| • Notre Dame Rock Climbing Club Member  | August 2024 - Present   |
| • Notre Dame Texas Club Member  | August 2024 - Present   |
| • Science Olympiad (Competitor, Mentor, Club President, Proctor, Event-Supervisor, and Lab Coordinator) | August 2011 - Present   |

### TECHNICAL SKILLS

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- Proficient Programming Languages: C/C++, HTML, Java, JavaScript, JSON, Julia, Python, Rust, XML
- Machine Learning & AI: Keras, PyTorch, Scikit-learn, TensorFlow
- Distributive Systems: Univa Grid Engine (UGE), HTCondor, SLURM
- Other Tools & Frameworks: ABB, Git, Honeywell, LaTeX, Linux/UNIX, Microsoft Suite, OpenFOAM, ParaView