Ryan Hartung

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Education

The University of Notre Dame — Notre Dame, IN
Ph.D. in Computer Science & Engineering — *Expected: 2029*
- Advisor: Dr. Douglas Thain
- Research focus: Distributed Systems and High Performance Computing

The University of Notre Dame — Notre Dame, IN
Master of Science in Computer Science & Engineering — *August 2025*

The University of Texas at Austin — Austin, TX
Bachelor of Science in Physics; Computation Option — *May 2024*
- Certificate in Elements of Computing

Teaching

The University of Notre Dame — Notre Dame, IN
Graduate Teaching Assistant — August 2024 - May 2025

- Elements of Computing II — Spring 2025
- Principles of Computing — Fall 2024

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

(Nov. 2025) Invited panelist at **XLOOP Workshop at SC '25** [St. Louis, MO] ⟹ Watch Here

Work Experience

The University of Notre Dame — Notre Dame, IN
Graduate Research Assistant — January 2025 - Present
- Assisting with the development of xGFabric under the supervision of Dr. Thain and the RADICAL-

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 Austin, Texas

Undergraduate Research Assistant 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

- 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

- 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