Ryan Hartung

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Education

The University of Notre Dame — Notre Dame, IN
Ph.D. in Computer Science — *Expected: 2029*
- Advisor: Dr. Douglas Thain
- Research focus: Distributed Systems and High Performance Computing
- Coursework: Compilers and Language Design, ML & AI: Graph Learning

The University of Notre Dame — Notre Dame, IN
Master of Science in Computer Science — *August 2025*
- Coursework: Advanced Computer Architecture, Data Science, Data Visualization, Graduate Operating Systems, Modern Web Development, Neural Networks, Secure Software Engineering, Special Topics in Advanced and Secure Networks

The University of Texas at Austin — Austin, TX
Bachelor of Science in Physics; Computation Option — *May 2024*
- Certificate in Elements of Computing
- Coursework in Linear Algebra, Modern Physics, Quantum Physics, Classical Electrodynamics

Teaching

The University of Notre Dame — Notre Dame, IN
Graduate Teaching Assistant — August 2024 - May 2025
- TA for Elements of Computing II and Principles of Computing

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.

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

Conferences

HPDC 2025 Notre Dame, IN

Attended From: July 20th - July 23rd, 2025

- Presented the following poster:
  - xGFabric: Coupling Sensor Networks and HPC Facilities with 5G Wireless Networks for Real-Time Digital Agriculture
- Schedule: Here

Throughput Computing 2025 Madison, WI

Attended From: June 2nd - June 4th, 2025

- Schedule: Here

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, 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, Microsoft Suite, OpenFOAM, ParaView