Andrew S. Van Horn

(314) 546-6228 | a.vanhorn@mst.edu | linkedin.com/in/andrewvanhorn | github.com/andrewvh4
1655 Legend Lane, St. Louis, MO 63146
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Education

Missouri University of Science and Technology — Rolla, MO
Bachelor of Science Electrical Engineering — *Aug. 2017 – May 2021*
Bachelor of Science Computer Engineering — *GPA – 3.837/4.0*
Minor in Mathematics and Physics

Professional Experience

Sandia National Laboratories — Livermore, CA
Intern Year Round - R&D Undergraduate — *June 2020 – Present*

- Developed Monte-Carlo simulations to model and characterize position sensor error for system improvement
- Developed automated PCB Unit Tester for functional verification
- Researched and reported on high-density memory devices for R&D projects
- Collaborated to define project requirements and review completed work from a remote environment

DE Design Works — Earth City, MO
Electrical Engineering Intern — *Jan. 2019 – Aug. 2019*

- Developed motor control interface software to expedite production and testing
- Developed control GUIs for production systems
- Assisted in hardware verification unit tests
- Worked directly with DE customers to fulfill project requirements

Mars Rover Design Team – Missouri S&T — Rolla, MO
Chief Technical Officer — *June 2019 – May 2020*

- Managed technical efforts for the 100-member Mars Rover Design Team
- Led a team of 14 subsystem leaders in managing the design, assembly, and verification of the Rover project
- Coordinated high-level team activity with other Executive Officers and the University
- Managed and conducted regular design reviews
- Ensured team was 2 weeks ahead on meeting program deliverable before the program was terminated due to COVID-19 pandemic
- Managed team activities through early months of COVID-19 pandemic

Electrical Architect — *June 2018 – May 2019*

- Acted as subject matter expert on embedded system design
- Developed and taught training course on embedded hardware development for new members
- Managed and maintained Electrical Lab space, including components stock, tool maintenance, and procurement
- Implemented unit test procedures to verify systems before release
- Reviewed and approved all designs for electrical systems
- Documented standards and best practices to ensure efficient production of all electrical systems

Active Member - Electrical Subteam — *August 2017 – May 2019*

- Developed numerous embedded systems to control Rover functions including sensor interface and motion control
- Contributed to research on IMU sensor fusion algorithms, inverse kinematics motion control, portable molecular spectroscopy, and terrain mapping
- Developed a Charged-Coupled Device interface for a custom UV Raman Spectrometer

Research Experience

Missouri S&T – Electrical and Computer Engineering — Dr. C. H. Wu
Undergraduate Researcher — *Sept. 2019 – Present*

- Developed programs to assist in discovery of properties in the Theoretical Quantum Cellular Automata framework
- Assisted in drafting, formatting, and compiling numerous manuscripts for submission
- Contributed to and analyzed theories on general-purpose Quantum Computing

Certifications

US Department of Energy: Q-Clearance (2020)
ARRL: General Class License (2015)

Technical Skills

Programming Languages
Experienced: C • C++ • C# .Net • Git • Python • MatLab • LaTeX
Familiar: Assembly • LabView • VB .Net • HTML • JS • Qt • Linux • APL
Programming Skills: Data Manipulation • GUI Development • Embedded Control • Hardware Interface
Other Skills: PCB Design (KiCAD, Eagle) • Circuit Simulation • NX-CAD

Upper/Graduate-Level Coursework

Quantum Mechanics 1 Physics 6201, Spring 2021
Linear Algebra II Mathematics 5108, Spring 2021
Introduction to Quantum Computing Computer Science 5001, Spring 2020 – A
Partial Differential Equations Mathematics 5325, Fall 2019 – B
Embedded Processor System Design Electrical Engineering 5160, Fall 2019 – A
Introduction to Complex Variables Mathematics 5351, Fall 2018 – A

Publications

C. H. Wu, **Andrew Van Horn**, "Space-Time Crystals and the Relation to Quantum Computing", Phys. Rev. Letters (In Review)

C. H. Wu, **Andrew Van Horn**, "Irreversibility in Quantum Computing and the Relation to Space-Time Crystals", Research Inventy: International Journal of Engineering and Science, 10, 2 (2020)

Jacob Lipina, **Andrew Van Horn**, Judah Schad, Kurt Kosbar, "Wireless Soil Sensor Pods for Long-Term Data Collection", International Telemetering Conference Proceedings, 54 (2018)

Presentations

Andrew Van Horn, "Space-Time Mixing of Quantum Computing in an Entangled Atomic Chain and Time Crystals", American Physical Society March Meeting, Denver CO (2020 – Canceled)

Jacob Lipina, **Andrew Van Horn**, Judah Schad, "Wireless Soil Sensor Pods for Long-Term Data Collection", International Telemetering Conference, Phoenix AZ (2018)

Awards and Honors

Missouri University of Science and Technology – University Scholarship (2017–2020)
Missouri Department of Higher Education – Bright Flight Scholarship (2017–2020)

Competitions

University Rover Challenge: Competition Team, Canceled (2020)
University Rover Challenge: Competition Team, 5^{th} International (2019)
University Rover Challenge: Competition Team, 2^{nd} International (2018)

Teaching Experience

PCB Design – A 3-week course on schematic design, PCB layout, and assembly (2018)