

Andrew S. Van Horn

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1505 Duke University Rd. 3A, Durham, NC 27701

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EDUCATION

Duke University

PhD Electrical Engineering

Duke Quantum Center

Durham, NC

Aug. 2021 – Present

Dr. Jungsang Kim

Missouri University of Science and Technology

Bachelor of Science Electrical Engineering

Bachelor of Science Computer Engineering

Minor in Mathematics and Physics

Rolla, MO

Aug. 2017 – May 2021

GPA – 3.865/4.0

PROFESSIONAL EXPERIENCE

Sandia National Laboratories

Intern Year Round - R&D Undergraduate (Telemetry)

Albuquerque, NM

June 2020 – Feb. 2021

- 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

Intern Year Round - R&D Undergraduate (QSCOUT)

Feb. 2021 – Aug. 2021

- Developed RF Frequency Servo PCB utilizing an FPGA and high-precision DAC/ADC
- Assisted in the assembly of a trapped ion cryogenic quantum computing system
- Developed software control wrappers to interface COTS devices with control server

DE Design Works

Electrical Engineering Intern

Earth City, MO

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

Chief Technical Officer

Rolla, MO

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

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 – inactive (2020)**ARRL:** General Class License (2015)

TECHNICAL SKILLS

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

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, 5th International (2019)**University Rover Challenge:** Competition Team, 2nd International (2018)

TEACHING EXPERIENCE

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