Addie Patterson

Versailles, KY | (859) 396-1679 | Portfolio: addiepatterson.com | patteral@rose-hulman.edu

Aspiring Theme Park Engineer and Innovative Problem Solver Majoring in Mechanical Engineering and Computer Engineering Looking for Fall 2025 Internship

EDUCATION

Master of Engineering Management — **May 2028**
Rose-Hulman Institute of Technology (RHIT), Terre Haute, IN — **GPA**: 4.00/4.00

Bachelor of Science, Computer Engineering & Mechanical Engineering — **May 2028**
Rose-Hulman Institute of Technology (RHIT), Terre Haute, IN — **GPA**: 2.83/4.00
Minors: Robotics and Systems Engineering

Associates of Interdisciplinary Studies — **Jan 2025**
Western Kentucky University (WKU), Bowling Green, KY — **GPA**: 3.87/4.00

Carol Martin Gatton Academy of Mathematics and Science in Kentucky — **May 2024**
Bowling Green, KY — **GPA**: 4.83/4.00

RELEVANT COURSEWORK

Control Systems · System Dynamics · Embedded Systems · Digital Systems · Microcontrollers · Computer Architecture · Signal Processing · AC Circuits · Circuits & Systems · Fluid Systems · Mechanics of Deformable Solids · Statics · Dynamics · Electronic Device Modeling · Object-Oriented Software Development · Graphical Communications · Computational Problem Solving · Intellectual Properties for Engineering · Junior Design

SKILLS

CAD & Design Tools: SolidWorks, Fusion360, Cura, Geometric Dimensioning & Tolerancing (GD&T), KiCAD
Simulation & Control Software: PSpice, Simulink, TwinCAT, Quartus Prime, Eclipse
Programming & Embedded Development: Python, C, Java, MATLAB, Verilog, Assembly (RISC-V), HTML, GitHub
Hardware & Systems: Microcontrollers, Programmable Logic Controllers (PLC), Servo Motors, Brushed Motors, Field-Programmable Gate Arrays (FPGA), 3D Printing, Soldering, PCB design
Professional Software & Productivity: Microsoft Office Suite, Google Workspace, Jira, Confluence, GNU Image Manipulation Program (GIMP), Canva, Visual Studio Code, GitBash, Basic Machining
Operating Systems & Platforms: Windows, macOS, Ubuntu, Windows Subsystem for Linux (WSL), Unix

INTERNSHIP EXPERIENCE

Robotics Support Specialist — **June 2025 – Present**
Badger Technologies (A Jabil Company) | Lexington, KY

- Monitored 700+ autonomous robots across 25+ companies in real time, analyzing system alerts, performance logs, and control system feedback to troubleshoot operational issues
- Authored 50+ Confluence technical documents on robot subsystems, repair protocols, and alert monitoring; boosting article traffic by 400%
- Remotely assisted technicians with field-replaceable unit (FRU) replacements and system repairs
- Utilized LiDAR technology to gather spatial data of retail store environments; processed data into editable 2D and 3D maps using AI tools and GIMP

RESEARCH EXPERIENCE

Undergraduate Research Assistant — **Feb 2023 – May 2024**
WKU — Dr. Lance Hahn, Psychological Sciences | Bowling Green, KY

- Developed Python scripts for EEG signal analysis, removing eye-blink artifacts via Fourier analysis filters and feedback control methods with 95% accuracy
- Utilized problem-solving skills to design a non-AI signal processing approach that achieved faster analysis and required less data than AI methods, eliminating the need for model training
- Documented analysis workflows in GitHub repository, ensuring reproducibility and version control; co-authored and presented a research poster at the WKU Student Scholar Showcase

ENTREPRENEURSHIP EXPERIENCE

Small Business Owner **Aug 2016 – Present**

Professionally Geeky Bakery & Apparel

- Modeled cookie cutters in Fusion360 and sliced 3D models with Cura; optimized 3D printer quality through hardware modification and troubleshooting to decrease material costs by ~30% and boosted sales by ~60%
- Managed the lifecycle of products through concept, design, production, branding, and customer delivery
- Designed and fabricated custom products using Canva, Procreate, and Cricut Design Space, operating heat press, sewing equipment, and digital fabrication tools for small-batch production
- Coordinated production scheduling, vendor events, and custom client projects, forecasting demand and managing inventory for e-commerce, markets, and catered events

PROFESSIONAL ORGANIZATION AFFILIATIONS

- **IAAPA (International Association of Amusement Parks and Attractions):** Attended 2025 Orlando Meetup; Certifications in *Managing Employee Safety Compliance*, *Effective Strategies for Providing Exceptional Guest Service*, and *Creating and Maintaining the Guest Experience*
- **ASTM F24 NextGen Task Group:** Participating student member contributing to discussions on amusement ride and device standards
- **IEEE (Institute of Electrical and Electronics Engineers)** – National Member
- **SWE (Society of Women Engineers)** – National Member

PROJECT EXPERIENCE

Autonomous Line-Following Vehicle | *Microcontrollers (ESP32), C++, PCB* **Feb 2026 – Present**

- Designed and built autonomous line-following robot using smart camera vision, IR sensors, and motor feedback to test power delivery and control strategies
- Developed ESP32 firmware in C++ for real-time steering, speed control, sensor data acquisition, and Bluetooth telemetry; created power system with custom PCB (via KiCAD) including energy monitoring, thermal management, and safety features
- Calibrated hardware subsystems including motors, steering servos, sensors, and power systems to optimize PID closed-loop control; shared results via technical poster and GitHub repository

Socket Chat Application | *C, TCP Networking*, *WSL* **Dec 2025 – Feb 2026**

- Developed two-way TCP chat application in C enabling bi-directional, non-blocking messaging, username exchange, and IP display across separate machines
- Designed non-blocking client-server architecture ensuring smooth real-time communication; debugged firewall conflicts and simultaneous I/O handling across machines

Pipelined RISC-V Processor | *Verilog, Visual Studio Code* **Sept – Nov 2025**

- Built single-cycle and pipelined RISC-V processors in Verilog, adding branch/jump and custom instructions while managing data hazards with forwarding and stalls
- Developed Verilog testbenches and used waveform analysis to debug, verify, and optimize instruction execution across all pipeline stages

Electromechanical System Modeling & Control | *MATLAB, Simulink, Bode Analysis* **Sept – Nov 2025**

- Modeled piezoelectric beams and loudspeaker drivers as dynamic electromechanical systems; analyzed vibration modes and coupling; tuned parameters to meet percent-overshoot and settling-time targets
- Applied Bode plot analysis and MATLAB/Simulink simulations to optimize system behavior, validate experimental results, and link theoretical models to real-world measurements

Blue Box | *Control Systems, C, Assembly, SolidWorks* **Feb – May 2025**

- Engineered embedded control system on a microcontroller, programming drivers, timers, and interrupts in C/Assembly while managing electrical signals, power, and PLC-style logic
- Integrated hardware and software to process keypad and push-button inputs, generating LCD feedback and DTMF signals via resistor network; designed SolidWorks enclosure using GD&T
- Validated user-ready prototype with oscilloscopes: tone accuracy ±0.01%, timing ±0.04%, and stable voltage/current behavior across 100+ test interactions

Pong FPGA Video Game | *Verilog, Quartus Prime, RISC-V* **Nov 2024 – Feb 2025**

- Engineered fully functional Pong game by designing sequential and combinational circuits on FPGA
- Applied synchronization and finite state machines (FSMs) to integrate subsystems; used Verilog testbenches and waveform analysis to ensure reliable real-time operation

Rose-Hulman Bonfire Game | *Java, UML* diagrams **Sept – Nov 2024**

- Implemented physics-based movement in Java, applying modular design and UML diagrams to enforce system cohesion, low coupling, and reliable behavior; integrated AI-generated assets with proper citation
- Managed workflow using Git and a shared calendar; documented team progress and resolved an ethical issue around unauthorized AI use, maintaining compliance and effective collaboration

Olympics Robot | *ESP32 PLC, C++, Closed-Loop Control* **Sept – Nov 2024**

- Engineered automated robot using ESP32 as PLC, integrating ultrasonic and color sensors with brush and servo motors into a closed-loop feedback system for motion control
- Programmed feedback and open-loop control in C++; implemented HMI for manual control; organized team goals and delegated tasks to reduce milestone completion time by 33%

Projectile Motion Simulation Game | *MATLAB, Simulink, App Designer* **Jan – May 2023**

- Simulated object trajectories in MATLAB via Simulink by animating differential equations; developed interactive GUI using MATLAB App Designer to visualize and control simulations
- Managed a small team, delegating tasks and troubleshooting problems to improve efficiency; thoroughly documented the design process and presented findings to a panel of WKU faculty

Cornhole Beanbag Launcher | *SolidWorks, 3D Printing, Basic Machining* **Aug – Dec 2022**

- Engineered prototype with wood, PVC, and a 3D-printed gear system in SolidWorks, applying basic machining to fabricate physical components; refined through iterative testing
- Outperformed all 16 competing teams by ≥20% in accuracy, reliability, and cost-effectiveness; demonstrated compliance with safety, environmental, and ethical engineering standards

LEADERSHIP & ACTIVITIES

Vice President, Competition Lead, & Founder | *RHIT Theme Park Engineering & Design* **Dec 2025 – Present**

- Co-founded multidisciplinary themed entertainment team; established design process, documentation standards, and risk-assessment methods aligned with ASTM F24 safety standards prior to prototyping
- Managed communications, coordinated club schedules, and oversaw subgroups to integrate mechanical and electrical systems, ensuring seamless collaboration from concept through prototyping

Hospitality & Outreach Coordinator | *Rose-Hulman InterVarsity* **Feb 2025 – Present**

- Organized orientation events reaching 70% of freshmen, boosting club membership by 140%; designed Canva social media campaigns driving 350% Instagram engagement growth; played piano and operated A/V systems for worship events

Student Representative | *RHIT Academic Computing Implementation Committee* **Aug 2025 – Present**

- Faculty-selected to provide feedback on Institute-standard computing platforms; collaborated with faculty, staff, and IT to evaluate vendor options, test demo units, and recommend solutions
- Served as the student voice in defining technical requirements and balancing performance, usability, and cost in platform recommendations affecting the entire Institute

Women's Varsity Tennis | *Rose-Hulman Institute of Technology* **Aug 2024 – Present**

- Named All-HCAC Honorable Mention for individual performance and impact on team success
- Demonstrated time management, resilience, and adaptability balancing competitive Division III athletics with dual-degree engineering and graduate coursework year-round

Outward Bound Leadership Expedition | *RHIT Noblitt Scholars Program* **July 2024**

- Worked within a team during an 8-day self-supported leadership expedition, developing collaborative decision-making, communication, conflict resolution, and situational awareness to demanding conditions
- Completed a solo leadership exercise, designing a safe, functional shelter with minimal materials; developed and executed a self-directed plan integrating technical skills and real-world impact

Additional: Gatton Student Ambassador (Aug 2023 – May 2024) · English Literature Study Abroad (Summer 2023) · Gatton Volleyball Club President (Aug 2022 – May 2024) · Viola (2016 – Present)