Alexander (Sasha) Ries

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Education

Colby College | *BA in Physics + Russian Language and Literature* Graduated May 2024
- GPA: Cum Laude - 3.93 | Awards: William A. Rogers Prize for meritorious achievement (Physics department)
- Activities and Societies: Slavic Honors Society, Physics Honors Society

Dartmouth College | *BE in Computer Engineering* Graduating Jun 2025
- GPA: 3.81 | Awards: Citation for excellence in ENGS 031 (Digital Electronics)
- Activities and Societies: Club Alpine Ski Racing, Dartmouth Formula Racing Team

Work Experience

Bechtel Plant Machinery Inc | *Computer Engineer (Active Secret level Security Clearance)* Jun 2024 – Sep 2024
- Designed a PCB to control a custom PTZ camera, utilizing I2C and DSI protocols, saving the company over $10,000
- Adapted quickly to new software by teaching myself KiCAD in under 2 weeks
- Implemented Power Over Ethernet (POE) and reduced power consumption of previous prototype by 30%
- Wrote a design report documenting part functionality, justification for design choices, and bill of materials list

Fitzlab Laboratory at Thayer | *Quantum Computing Research Assistant* Aug 2022 – Sep 2023
- Drove a design project modeling and machining 3D EM resonator cavities for superconducting circuits
- Streamlined prototyping process by simulating responses to different EM signals in Ansys HFSS
- Collaborated with team members to integrate superconducting circuit designs into 3D optical Qubits
- Illustrated multi-part blueprints of Qubit models for machining using AutoCAD

Dartmouth Biomedical Engineering Center | *Computational Research Assistant* Aug 2022 – Jun 2023
- Automated image analysis in Python for images taken during Polymer Fatigue Crack Propagation Tests
- Created reference point detection using Numpy and color gradients analysis
- Created a user interface for updating data using Pandas and OpenCV
- Reduced time needed by over 60% for researchers to analyze Polymer fatigue characteristics

Projects

DFR Electric Car Traction Control System | ***Embedded Systems, C, Digital Control, High Speed Digital Circuits***
- Programmed in C a closed loop digital control system to regulate torque output and reduce wheel slip
- Enabled front wheel speed sensing using rotary encoders, an STM-32 microprocessor and CAN bus communication
- Manually rewired traces on the sensor board PCB to quickly fix design issues based on previous KiCAD design file

Pendulum Stabilizing PID Controller | ***MATLAB, Analog Control, Applied Physics, ADC***
- Led my team in designing an analog PID controller to balance a pendulum on a DC electric car
- Mathematically modeled pendulum and car as a linearized system
- Simulated and determined most stable controller using MATLAB Siso Tool
- Won competition for most robust and overall best controller

Dialed AI Mindset Boosts (IOS app) | ***Python, Prompt Engineering, Product testing***
- Developed input to audio output pipeline using Google Firebase, Eleven Labs, and Claude APIs
- Optimized audio speech quality for the app by prompt engineering Claude Opus 3.5
- Determined ideal use case by designing, implementing, and analyzing beta tests with users

Klister spreading tool – Cross Country Ski Wax Applicator | ***C++, Embedded Systems, SolidWorks***
- Led designing and creating an automated electric heating tube to optimize Klister wax viscosity
- Programmed a digital control loop in C++, maintaining optimal temperature range in the heating tube
- Used SolidWorks to design and 3D-print screw-on attachments for distributing and spreading Klister on Nordic skis

Field-Programed Gate Array Morse Code Translator | ***VHD, Digital Circuit Design, Oscilloscope***
- Utilized VHDL to program an FPGA, enabling it to take keyboard signals and output audible beeps in morse
- Assumed sole responsibility within a collaborative team environment due to my partner's inability to participate
- Modeled an ASCII to morse code translator as a multi-level hardware circuit block diagram

Skills

Programming: Python (Pandas, Numpy, OpenCV, TensorFlow), Java, VHDL, MATLAB, C/C++
AutoCAD: KiCAD, LT Spice, Ansys HFSS, SolidWorks
Soft Skills: Documentation, Adaptability, Time Management, Public Speaking, Discipline, Advanced Russian