

# Adam M. Exley

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## OBJECTIVE

Summer 2024 internship directly applying skills in advanced hardware design and test which can benefit from my experience in software development

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## EDUCATION

The Ohio State University, Columbus, OH	Overall GPA (4.00 Scale): 4.00
B.S. Electrical and Computer Engineering	Expected Graduation: May 2024
M.S. Electrical and Computer Engineering	Expected Graduation: May 2025

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## WORK EXPERIENCE

### **Keysight Technologies**, Colorado Springs, CO

R&D Hardware Engineering Intern (*Effective October 2023*)

New Product Introduction (NPI) Engineering Intern (*May – August 2023*)

- Rewrote and documented existing production tests into new platform, while also revising test methods, resulting in a ~2.5X improvement in unmanned test time
- Analyzed multi-year test backlog for specific key high-complexity parts to gain insight into the root cause of failures and correlations between multiple test suites

### **Lake Shore Cryotronics**, Westerville, OH

Electrical Engineering Product Development Intern (*May – August 2022*)

- Designed and evaluated ultra-low-noise ( $0.8 \frac{nV}{\sqrt{Hz}}$ ) high-impedance JFET amplifiers for use as analog measurement frontends
- Fabricated isolated preamplifiers to evaluate noise performance, frequency response, and other characteristics of different analog systems
- Automated frequency response measurements of electrical source and measurement units using Python
- Performed final testing on measurement systems before being shipped to customers

### **Center for Design and Manufacturing Excellence**, Columbus, OH

#### **Artificially Intelligent Manufacturing Systems (AIMS) Lab**

Research Assistant (*February 2021 – Present*)

- Engaging in implementation-focused research using robotics, artificial intelligence, and simulations to develop novel techniques for integrating robotics in manufacturing
- Developing open-source software in C++, C#, and Python to interact with industrial robots
- Lab subject matter expert on large-scale and parallel computation

### **Department of Engineering Education, Ohio State University**, Columbus, OH

Teaching Assistant – Fundamentals of Engineering for Honors (*August 2022 – Present*)

- Instructing and engaging with first-year Honors students in a classroom environment
- Collaborating with peers and instructors to create and update course content
- Providing constructive feedback and advice while evaluating / grading student work

### **FirstEnergy**, Akron, OH

IT/OT Field Area Network Intern (*May – August 2021*)

- Managed and updated configurations of ~2,000 cellular radios used for supervisory control and data acquisition (SCADA) of electrical grid
- Developed a novel and dynamic work management platform in MS SharePoint using MS Power Automate

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## PROJECT EXPERIENCE

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### **Rapid Graphics-Accelerated Paint Simulation** (*October 2022 – October 2023*) @ AIMS Lab

- Utilized NVIDIA CUDA C++ to parallelize an existing simulation scheme, reducing runtime by >3 OoM
- Leveraged NVIDIA OptiX raytracing engine for computations
- Architected new mathematical model for paint spray to be more extensible, physically accurate, and computationally performant than previous implementation

### **Ultra-Low-Noise JFET Frontend Design** (*June – August 2022*) @ Lake Shore Cryotronics

- Designed discrete-JFET differential amplifier frontend for voltage measurement unit, providing improved impedance and noise compared to current opamp-based design
- Calculated key metrics (voltage/current noise, bandwidth, etc.) analytically and verified with SPICE simulations
- Studied and utilized historical designs as a starting point to avoid common pitfalls
- Designed PCB layout to minimize input capacitance and to allow for key quantities like drain current to be easily modified

### **Augmented Reality Paint Sim. Visualization** (*November 2021 – October 2022*) @ AIMS Lab

- Created algorithms to resample, wrap, and interpolate samples from the faces of a 3D mesh into continuous 2D texture
- Developed software to display simulation results on top of physical objects by using an augmented reality environment aligned to the physical environment using QR codes
- Designed for Microsoft HoloLens 2 using external computer for simulations/data processing

### **Robot Pose Estimation and Verification** (*February – October 2021*) @ AIMS Lab

- Created algorithm to predict joint angles of a 6-axis robotic arm using an RGBD (depth) image from an Intel Realsense camera with minimal provided information
- Developed automated object annotation/labelling system for a Mask R-CNN instance-segmentation convolutional neural network based on robotic forward kinematics, 3D mesh rendering, and camera specifications

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## SKILLS

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- **Circuit & PCB Design:** Low-Level Analog Design, Noise Analysis / Low Noise Design, PCB design, Microsoldering
- **Design Suites:** Altium Designer, KiCAD, SPICE Simulators, Multisim, Simulink, Quartus Prime, Vivado
- **Measurement Equipment:** Oscilloscopes (Real-time and Sampling), Spectrum Analyzers, Vector Network Analyzers, Signal Source Analyzers, Signal / Function / Pulse Generators
- **Programming/HD:** C++, C#, Python, CUDA, PyTorch, C, MATLAB, VHDL, Verilog, Assembly, Robot Operating System (ROS)
- **Development Tools:** Visual Studio, VS Code, Git, Unix, Unity
- **General:** CAD/CAM Prototyping

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## RELEVANT COURSEWORK

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Mixed Signal VLSI — Analog ICs — Computer Architecture — Machine Learning  
Feedback Control — Adv. Digital Design — Power Systems — Signals & Sys.  
Analog Sys. & Circuits — Electronics — Semiconductor Electronic Devices —  
Microcontroller Sys. (Assembly) — Real-Time Robotics — Intro RF/Optical — Digital Logic  
Eng. Technical Writing