Alexander Rizzi

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EDUCATION

Purdue University, West Lafayette, IN   **Expected Graduation:** May 2026
Bachelor of Science in Computer Engineering
Relevant Coursework: ASIC Design Lab, Embedded Systems, Data Structures & Algorithms, Signal Processing
Programming/HDL: Python, C/C++, Java, JavaScript, SystemVerilog, QuestaSim, Vivado, Assembly [RISC-V]
Technical Skills: RTL Design, PCB Design, SQL Database, Git/GitHub, Linux, KiCAD, Embedded Systems

EXPERIENCE

Embedded Systems @ Purdue Club: Purdue University, West Lafayette, IN
MicroPiano Project Team Lead   **August 2025 – Present**
- Leading 6-member team developing RP2350-based synthesizer with MIDI functionality
- Developing and testing high-performance firmware leveraging multi-core functionality for key scanning with hall effect velocity sensing and interfacing with external DAC/ADC via SPI
- Designing multi-board PCB network with controller-satellite architecture enabling dynamic module connection and removal using UART, CAN protocols

Broadridge Financial Solutions, Manhattan, NY
Industrial Engineering Intern   **May 2024 – August 2024**
- Performed large-scale cost-benefit analysis for potential purchase of Formlabs Resin 3D printer for integration with existing workflow; projected annual recurring cost savings of **$90,000/year**
- Generated high-fidelity part scans to build a reverse-engineered printable part library

Software Engineer   **August 2024 – May 2025**
- Engineered full-stack ElectronJS desktop application with direct API connection with Formlabs Resin 3D printer, parts library management, print history, and version control
- Managed remote development work for 12 months, maintaining industrial-scale SQL database and development of remote management dashboard for machine parts library

PROJECTS

Hardware Neural Network Inference Accelerator
- Designed and implemented systolic array hardware for accelerating AI workloads using SystemVerilog
- Integrated AHB interface with pipelined memory controller to 8x8 systolic array, meeting timing constraints and operating at 100MHz
- Designed signal-level testbenches to verify data flow, timing behavior, and AHB protocol compliance

Piano-to-MIDI Hardware Conversion
- Reverse-engineered Casio SA-67 key matrix from circuit schematics, overcoming non-standard column indexing to integrate RP2350 MCU
- Developed C++ firmware implementing USB MIDI protocol with millisecond response time and octave shifting functionality

Real-Time Computer Vision System
- Real-time object recognition implemented using OpenCV and YOLOv8 using GPU hardware acceleration
- Processing of upscaled live data-feed from camera at intersection in West Lafayette sent through HTTP server and processed, analyzing traffic status and pedestrian activity to generalize hourly traffic trends