

# Matthew Wei

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## EDUCATION

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- **University of Illinois at Urbana-Champaign** Champaign, Illinois  
*Bachelor of Science - Electrical Engineering* *Aug 2020 - May 2024*  
*Minor in Computer Science and Mathematics*  
*GPA: 3.51/4.00*  
*Courses: Digital Systems, Computer Architecture, Computer Systems, Applied Parallel Programming, Electronic Circuits, IC Device Theory & Fabrication, Analog Signal Processing, Digital Signal Processing, Data Science & Engineering, Data Structures & Algorithms*

## SKILLS SUMMARY

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- **Languages:** C/C++, SystemVerilog, Python, HTML/CSS, Java, x86 Assembly, JavaScript, Perl
- **Tools:** Git, Excel, KiCAD, Cadence, Altera Quartus, LTSpice, MatLab
- **Platforms:** Linux, Windows, Labview, macOS, CUDA

## EXPERIENCE

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- **Microsoft** Redmond, Washington  
*Electrical Engineer Intern* *May 2023 - Aug 2023*
  - Designed a liquid ingress sensor on Microsoft's Surface Laptop for internal fluid detection leveraging both circuit and microcontroller design with easy-integration into Surface's pre-existing schematic designs. Reduced the COGS by an estimated \$0.60
  - Collaborated closely with cross-functional teams including layout designers, software developers, DFX testers, and mechanical engineers to ensure optimal placement and seamless integration into Surface's enclosure
  - Conducted simulations and tests on 140 Watt battery IC, boosting power output for future USB-C device implementations with an efficiency up to 96%
- **Texas Instruments** Dallas, Texas  
*Validation Engineer Intern* *May 2022 - Aug 2022*
  - Developed multiple scripts to reduce testing time and data collection for RF and Bluetooth device validation for embedded processing chips including separation of test sequences, automatic generation of compiled data files, and instant test creation for new device implementation
  - Created a user-friendly Labview application GUI to work in parallel with Texas Instrument's testing UI
  - Authored design and script documentation, wrote and conducted unit tests, and integrated into Texas Instrument's pre-existing testing platform
  - Analyzed, organized, and compiled data from device's benchmark tests to be uploaded to data management server
- **Construction Engineering Research Laboratory** Champaign, Illinois  
*Research Intern* *June 2021 - Aug 2021*
  - Accelerated development of water-treatment project by incorporating electrical devices such as methane sensors, solenoids, and pH detectors onto system's infrastructure
  - Devised and assembled improved plumbing routes on system to work with a PLC controls unit coded in RS Logic, increasing runtime efficiency up to 12%
- **Diteq** Lenexa, Kansas  
*CAPS Student Worker* *Aug 2019 - Dec 2019*
  - Pioneered and integrated new product management method through cycle counting to warehouses for improved inventory accuracy

## PROJECTS

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- **Linux-Based Operating System (Operating Systems, Low-Level Programming):** As a team of 4, developed an x86 operating system modeled after the Linux kernel which includes support for device drivers, paging, interrupt and exception handling, file and memory management, and system calls. Tech: Linux, C, x86 Assembly (Intel 32-bit Architecture)
- **LC-3 Processor (Hardware Design, Computer Architecture):** Developed a 16-bit CPU complete with an instruction cycle, register file, memory access, and ISA support. Tech: SystemVerilog, FPGA, RTL Design, Digital Simulation, Finite-State Machines
- **Convolutional Neural Network (Parallel Programming, GPU Programming):** Implemented a parallelized feed-forward neural network utilizing constant and shared memory, tiling, matrix unrolling, and input channel reduction techniques such as atomics and trees. Tech: C, CUDA, Nsight Compute
- **Linear Voltage Regulator (Analog Circuit Design, Power, Electronics):** Designed a AC-DC voltage converter utilizing diode rectifiers, filters, zener diode regulator, and a BJT DC-DC converter verified with design simulation and efficiency testing. Tech: LTSpice, Schematics, Soldering, Oscilloscope, Signal Generators
- **AM Radio Receiver (Analog Signal Processing, Communications, Electronics):** Constructed analog superheterodyne receiver with op-amps, envelope detectors, and bandpass filters. Tech: Signal Generators, Oscilloscopes, Spectrum Analyzer