Brandon Wang

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EDUCATION

The Ohio State University Columbus, OH

B.S. in Electrical Engineering | Land Grant Scholarship (Full Ride) *Expected May 2027*

Areas of Interest: PCB Design and Layout, Wearables and Implants, Medical Devices, Radio Frequency

ACADEMIC RESEARCH

Wearable and Implantable Tech., Electroscience Lab | Undergraduate Researcher Columbus, OH

Wearable RF Integrated Game Controller *Aug. 2025 - Present*

Tools: EasyEDA Pro, LTspice, nRF52840 (MCU), LSM6DS3TR (IMU), CircuitPython, Network Analyzer, Spectrum Analyzer

- Leading hardware design for a **wearable game controller** for kids, in collaboration with Nationwide Children's Hospital
- Designing **12MHz transmitter/receiver** pair **schematic and layout**, meeting a *40mm* max footprint requirement
- Developing low-latency **embedded firmware** for the **nRF52840 SoC** to process real-time **analog-to-digital** inputs
- Expanded system input capability by *200%* by integrating analog **IMU** and **Force-Sensitive Resistor (FSR)** sensors
- Optimized for passband frequency and signal integrity by **simulating** and **characterizing** custom **Chebyshev filters**

Magnetocardiogram (MCG) Sensors *Jan. 2024 - Jan. 2025*

Tools: KiCad, MATLAB, LABVIEW, Empirical Mode Decomposition, Coil Array Design, MCG & ECG Apparatus, Fusion360

- Simplified MCG testing setup, reducing complexity by *50%* and improving the **signal-to-noise ratio (SNR)** by *10%*
- Wrote a **signal processing** program in **MATLAB** using **EMD algorithm** to extract averaged frame from large datasets
- Built a **LabVIEW GUI** to simultaneously collect and synchronize data from both MCG and electrocardiogram systems
- Created a new **coil array** housing to boost testing efficiency and enabling color customization when testing with children

WORK EXPERIENCE

General Electric (GE) | Electrical Engineering Co-op Louisville, KY

Dishwashers, New Product Introduction *May 2025 - Aug. 2025*

Tools: Cadence Virtuoso, Python, Tableau, Automation, FRACAS, Oscilloscope, ESP32, Management, Test Reports

- Drove long-term design improvements and reliability by conducting **root cause analysis** (RCA) on 3 unique **FRACAS**
- Managed over *100+* dishwashers in field tests, ensuring up-to-date software, continuous operation, and test reliability
- Designed a **ESP32 shield** with **VL53L0X IR sensor** in **Cadence Allegro** to transmit distance data with *90%* accuracy
- Built a **Python automation** tool to manage weekly OTA software and health checks, eliminating *95%* of manual effort
- Reworked dishwashers in test labs to integrate a new LCD from an alternate manufacturer, ensuring *100%* functionality

Refrigeration, Cost of Quality *Jan. 2025 - May 2025*

Tools: Root Cause Analysis, ALT, ESD Testing, PCB Rework, Oscilloscope, Multimeter, Ultrasonic Sensors

- Used **accelerated life testing** (ALT) methods to evaluate and compare the long-term reliability of multiple LED models
- Designed test board panels to efficiently compare *5+* different LED color temperatures and its effect on food appearance
- Performed **ESD and power integrity validation tests** using oscilloscopes and **DMMs** to identify root-cause of failures
- Validated reliability of new ultrasonic sensors by testing performance across varying sensitivity and coupling parameters
- Performed in-depth **RCA** on refrigerator PCBs to identify manufacturing defects and enhance overall quality control

PROJECTS

Rotisserie Function For Indoor Meat Smoker

- Prototyped a modular H-bridge AC motor controller with main voltage rail isolation to enable variable speed control
- Integrated an AC motor and light into the existing indoor smoker system with minimal structural and electrical changes

Assistive Pushing Device for Strollers

- Created an adaptable stroller attachment to ease physical demands of caregiver by assisting in pushing a stroller up hills
- Integrated ratchet systems in wheel hub to enable coasting at higher speeds without additional resistance from motor

TECHNICAL SKILLS

Design Software: Cadence Virtuoso, KiCad, EasyEDA Pro, LTspice, Tableau, LabVIEW, Fusion360, Solidworks, Windchill
Benchtop Tools: Oscilloscope, DMM, Spectrum Analyzer, Network Analyzer, Waveform Generator, Power Supply, Soldering
Embedded & Firmware: MATLAB, Python (NumPy, BeautifulSoup), MCUs (STM32, nRF42840, Arduino), I2C/SPI, C++