

Jaden Rhee

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Education

University of Michigan

B.S. Electrical and Electronics Engineering, Minor in Computer Science

Ann Arbor, MI

Expected 2028

Michigan State University | Honors College

B.S. Electrical Engineering | GPA: 3.7

East Lansing, MI

Transferred 2026

Experience

ECU Design and Validation Intern, Bosch - Plymouth, MI

April 2026 - Aug 2026

- Analyzed Tesla Model 3 ECU wake-up waveforms as a known-good baseline for an intermittent startup failure, identifying abnormal power-rail timing and incomplete discharge in the failure condition
- Designed a high-speed ECU power-switching fixture with PMOS and NPN transistors to reproduce abnormal rapid power-up (83-85 us) across 5 ECUs while preserving ground reference; measured startup current above the 30 A probe range
- Instrumented ECU PCBs for bring-up and debug, tracing the failure from vehicle input into internal power rails and correlating rail collapse with ground-reference movement using PicoScope and Teledyne LeCroy oscilloscopes
- Simulated buck and boost power circuits in CST and PSpice; recreated a boost-converter schematic and layout in KiCad and bench-tested automotive regulator efficiency against datasheet expectations

Research Assistant, Musculoskeletal Biomechanics & Imaging Laboratory, U-M - Ann Arbor, MI

Aug 2026 - Present

- Designed the electronics and flex-PCB layout in Altium for neck- and back-mounted IMU wearables, translating sensing requirements into schematics, circuit design, component placement, and routed boards
- Fabricated and brought up sensor prototypes by soldering and reworking flex-PCBs, then troubleshooting electrical faults and IMU signals with oscilloscopes, DMMs, bench supplies, and lab instrumentation
- Built data-acquisition code and ML-based analysis workflows for multi-axis IMU measurements, connecting hardware prototypes through data collection, evaluation, and validation of wearable biomechanics sensing

Research Assistant, Human-Automation Technology Lab, MSU - East Lansing, MI

Sept 2025 - May 2026

- Developed a glasses-mounted wearable IMU prototype on Arduino Nano 33 BLE for head-nod detection, integrating motion sensing and data acquisition to capture 1-2 s multi-axis inertial windows for algorithm development and validation
- Evaluated DSP and deep-learning speaker-verification pipelines for resource-constrained edge hardware, optimizing MFCC, RMS, and ZCR feature extraction by ~50% and profiling accuracy, compute, and implementation tradeoffs
- Co-authored an IEEE MWSCAS 2026 paper; developed the embedded BLE case study and contributed experimental analysis, figures, and tables comparing deployable speaker-verification approaches

Projects

JRWatch - Custom Low-Power BLE Smartwatch

github.com/jadenrhee/JRWatch

- Designed a 36 mm, 4-layer nRF52840 smartwatch PCB in KiCad with IMU, memory display, and USB-C; completed schematic/layout with zero ERC/DRC violations
- Engineered gated power domains and event-driven power states, projecting 15 uA armed-sleep current and 4-8 month battery life on a 150 mAh cell

WiggleCam - 4-Lens Digital Wigglecam Camera

github.com/jadenrhee/wigglecam

- Designed a 76 x 50 mm, 4-layer RP2040 co-processor PCB for constant-current LED flash, shutter debounce, battery telemetry, and multi-camera synchronization over I2C/UART
- Implemented hardware-enforced flash safety limits and synchronized four 16 MP sensors through a single CSI interface for repeatable multi-view capture

Publications

Rhee, J., Kumar, N., Chen, X., et al. *Evaluating Edge Speaker Verification ML Pipelines: A Multi-Variable Optimization Framework*, IEEE MWSCAS 2026

Skills

Hardware & Lab: PCB Design, Flex PCBs, Schematic Capture, Altium, KiCad, SI/PI, Oscilloscopes, DMMs, Soldering/Rework

Circuits & Interfaces: Buck Converters, Boost Converters, LDOs, ADCs, DACs, Op-Amps, I2C, SPI, UART, CAN, LIN, BLE

Tools & Programming: PSpice, LTspice, CST Studio Suite, MATLAB, Simulink, CANalyzer, C, C++, Python, Verilog