Tyra Correia

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Education:

Master of Science, Electrical Engineering, Concentration in Control Systems — **Jan 2025- May 2026**
University of Michigan-Dearborn, Dearborn, MI — **GPA: 3.93**

Master of Engineering Management, Awarded Graduate Assistantship — **Feb 2024- Nov 2024**
Rose-Hulman Institute of Technology, Terre Haute, IN — **GPA: 3.87**

Bachelor of Science, Electrical Engineering, Minor in Language and Literature — **Sept 2020- Feb 2024**
Rose-Hulman Institute of Technology, Terre Haute, IN — **GPA: 3.62**

Skills:

Software: Java, Python, PLC, C, MATLAB, TensorFlow, PyTorch, GitHub, Simulink, Arduino IDE, Maple, R, Modelsim, Quartus, PSPICE, NI LabVIEW, CST, DesignSpark, SolidWorks, AutoCAD, KiCAD, Eagle Test Systems, MPLAB, ANSYS HFSS, Allen Bradley PLC, Ignition HMI

Equipment: Oscilloscopes, Digital Multimeters, Microcontrollers, Automatic Test Equipment, VNAs, Vision Systems, 3D printers, Logic Analyzers

Experience:

Electric Vehicle Engineering Intern/ *Hitachi Astemo, Greenfield, IN* — **May 2024-Aug 2024**

- Investigated root causes for critical electromechanical and controls failure on power control unit assembly production line to reduce down time, improve fault identification and decrease manufacturing cycle time
- Addressed production and efficiency concerns through Allen Bradley PLC and Ignition HMI updates
- Prepared test procedures and debugged faults on electrical characteristics and insulation resistance testers

Sophomore Resident Tutor/ *Rose-Hulman Institute of Technology, IN* — **Sep 2023- Dec 2024**

- Facilitated over eight exam review sessions and held weekly individual study hours groups of students
- Received positive feedback from participants leading to a notable increase in exam scores by two letter grades

Grader and Lab Assistant/ *Rose-Hulman Institute of Technology, IN* — **Sep 2022- Dec 2024**

- Graded assignments and lab assisted for six courses in 200 and 300 level electrical engineering courses

STEM mentor for EMERGE program/ *Rose-Hulman Institute of Technology, IN* — **Oct 2022- Feb 2024**

- Led mentorship or thirty freshmen female high school students, enhancing awareness of STEM career pathways through interactive discussions and activities
- Monitored three field trips to enhance the students' experience of STEM industry and university environment

Solar Power Engineering Intern/ *ALEC Energy, Dubai, UAE* — **Oct 2019- Nov 2019**

- Studied load schedules and single line diagrams for Dubai Hills Mall solar project
- Observed operation of solar inverters and learned about design parameters for Solar PV plants
- Analyzed efficiency of solar power control system for Nestle Solar Plant

Projects:

ALFC for a Turbine Power System — **Feb 2025- May 2025**

- Developed state-space models for single and dual-area turbine systems with reheater and tie-line dynamics
- Designed and implemented full-state feedback control using Linear Quadratic Regulator (LQR) and observer-based estimation to ensure frequency and voltage stability under load disturbances
- Validated robustness via MATLAB/Simulink under model uncertainty, noise, and initial state perturbations

Mars Rover Terrain Classification — **Sept 2024- Nov 2024**

- Designed and trained U-Net and DeepLabV3 architectures for semantic segmentation on 1024×1024 images
- Enhanced model robustness by addressing unlabeled pixel handling, reducing overfitting, and optimizing training efficiency
- Conducted performance benchmarking, improving accuracy over baseline CNN and analyzing computational tradeoffs for real-time deployment suitability

Real-Time ASL Detection — **Jul 2024- Aug 2024**

- Leveraged transfer learning on AlexNet to recognize and translate American sign language gestures with 98.5% accuracy
- Applied live updating text translations with real-time webcam footage with 3s delay for CNN classification

Fruit Finder Algorithm — **Jul 2024- Aug 2024**

- Implemented pre-processing, pixel extraction, threshold detection, masking and morphology techniques to recognize key fruit objects in images
- Assessed performance of algorithm across three key test images with bounding boxes assigned per fruit object

Buck-Boost Power Supply — **Feb 2024- May 2024**

- Designed 12V to -25V DC-DC negative voltage power supply with 2A current limit and 100mV output ripple
- Streamlined PWM circuitry for IC control and isolated gate driver with over-voltage clipping circuit
- Engineered a charge pump for the negative voltage supply and ensured reliability with operational amplifier monitoring system

Low Pass Filter Power Integrity Analysis **Dec 2023- Feb 2024**

- Constructed 2nd order low pass pi-filter for frequencies less than 100MHz with 40dB/dec drop off
- Refined the parasitic model using ANSYS HFSS, ensuring accurate simulation results that aligned closely with measured outputs and enhanced overall design reliability for frequencies below 100MHz

DAC and ADC Testing **Dec 2023- Feb 2024**

- Performed continuity, offset, gain, and linearity tests on TLV5616 and ADC0831 chips using ETS ATE programmed through LabView

Senior Design Open-Source Syringe Anesthesia Pump Project **Sep 2023- Feb 2024**

- Managed cross-functional collaboration on a modular affordable anesthesia syringe pump developed under $150 targeting low-resource countries; design employed open-loop control and touch screen LVGL-based UI
- Co-ordinated assembly of PCB with dual power regulation, sound integration, SD card slot, WIFI connectivity, USB power delivery and stepper driver daughter board

Advanced Error-Correcting Encoding **Sep 2023- Dec 2024**

- Generated MATLAB scripts to implement convolutional encoding and Viterbi decoding for rate ½ convolutional codes, applying trellis termination and decoding optimization for error-correcting codes
- Simulated Bit Error Rate (BER) performance for coded versus non-coded BPSK transmission over AWGN channels, plotting performance against Eb/N0 values
- Implemented a Log-MAP BCJR decoder for recursive convolutional codes, incorporated into a turbo coding scheme with iterative decoding, which achieved BER improvements with systematic doping

Robotic Car Power Supply and Controller **Feb 2023- May 2023**

- Composed PCB power supply to deliver 6V-12V to the robotic car system at a cost of under $120; tested power drawn and performed PSPICE calculations for manual and Bluetooth charging
- Programmed a line following PID controller in C, ensuring that the robotic car maintained stability across two different test environments

DTMF Decoder **Sep 2023- Nov 2023**

- Programmed decoder system to load audio recording of sixteen DTMF tones in LabView using MathScript RT
- Calculated the DFT spectrum for the DTMF tones across sub-ranges and decoded the processed input using desired threshold values to confirm the decoded result

Pseudorandom Infrared Communication System and DataLink Simulator **Feb 2023- May 2023**

- Constructed a pseudorandom transmitter by building and connecting the PSG, modulator, and infrared LED
- Produced transmitter counterpart using a trans-impedance amplifier, BPF, envelope detector, Comparator and flip flop to process signals at a range of 20m

Medical Diagnosis Embedded Detector **Feb 2022- May 2022**

- Programmed MSP432P4111 to display a UART interface in C which gathered patient information to store in a database
- Prompted user for temperature reading through two wire TMP101 sensor, counted down time taken for procedure on 7 segment display and displayed final diagnosis

Leadership: Alpha Omicron Pi, *Director of Chapter Property*
Feminist Engineers Movement, *Secretary*

Activities: IEEE, *Member*
Engineers for a Sustainable World, *Member*