

VIKRANTH VAKATI

Embedded Software Engineer

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EDUCATION

Wentworth Institute of Technology

- Master of Science in Computer Engineering, Concentration in Internet of Things Expected April 2024
- Bachelor of Science in Computer Engineering, Minors in Electrical Engineering and IoT December 2022

EXPERIENCE

Electrical Systems Test Engineer | Delta Magnetics and Controls

January 2021 - January 2023

Custom control panel design and fabrication for process automation

- Designed and fabricated custom control panels for process automation following IEC standard diagrams
- Conducted visual, point-to-point, and operational testing on control panel systems to ensure functionality
- Contributed to the successful deployment of reliable control panel systems, ensuring adherence to quality and functionality requirements

PROJECTS

Real-Time Energy Monitoring System

March 2024

Energy data aggregation system to optimize university campus power generation using Python and JavaScript

- Developed and implemented prototype modules to monitor power supply, generation, and consumption data
- Aggregated diverse data from legacy and modern systems, enabling historical and real-time power analysis
- Crafted a web interface to streamline the analysis of aggregated energy data, facilitating informed decision making and enhancing accessibility of power metrics

Security Camera

February 2024

Low-cost real-time security camera using the ESP32-CAM microcontroller

- Established seamless network connectivity for remote access to live camera feeds via Wi-Fi network
- Improved security measures by implementation of motion detection algorithms to trigger real-time alerts
- Enhanced user accessibility with an intuitive web interface to view and control the camera feed

Automated Hopper Dispensing System

August 2023

Ladder logic program to automate a hopper for efficiently filling boxes on a conveyor belt

- Utilized CLICK programming software and a 4-channel PLC to streamline the process of filling boxes
- Refined operational visibility through integration of indicator lights, enhancing system monitoring capability
- Validated system reliability to guarantee responsive operation under various input conditions

Antenna Controller Design

August 2023

Digital lead controller for an antenna control system using MATLAB and Simulink

- Created a lead compensator structure, strategically placing poles and zeros to ensure the compensated root locus aligns with the desired dominant closed-loop pole
- Employed root locus analysis to optimize the system, focusing on transient performance metrics such as settling time and overshoot
- Enhanced system stability and response, achieving within 0.8% of the desired performance specifications

Optical Heart Rate Detection

April 2023

Non-invasive heart rate detection algorithm using MATLAB

- Implemented color signal extraction, strategically selecting optimal channels and regions of interest
- Applied signal processing for frequency domain analysis to capture changes related to the cardiac cycle
- Performed extensive testing and optimization, achieving a 90% accuracy rate for the HR detection algorithm

SKILLS

Technical Skills: Embedded development, Web development, Networking, Hardware testing

Languages and Tools: C/C++, Python, Assembly, Verilog, SQL, MATLAB, JavaScript, Node.js, React.js, Ladder Logic

Software: Git, LabView, MultiSim, Simulink, Click PLC, Quartus, Figma, Wireshark, SolidWorks, Linux, Windows

Equipment: Microcontrollers, FPGA, Multimeter, Oscilloscope, Function Generator, Power Supply, Logic Analyzer

Protocols: SPI, I2C, BLE, LoRa, Wi-Fi, UART, RS232, RS485, Modbus, RFID

PUBLICATIONS

Automated Soil Testing Network for Rural Farming | EAI BICT 2023 pp 31-39 | bit.ly/3TsB0U8

August 2022

Low-cost offline mesh network to monitor conditions on remote farms using ESP32 nodes and environmental sensors

- Programmed each node to periodically collect sensor data and transmit to a centralized server node
- Constructed a custom web interface, providing farmers with valuable insights and decision making tools
- Optimized the system for reliability and performance with a 4% packet error rate, resulting in a system that is dependable in rural areas with limited internet connectivity