Jenil Makwana

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Education

University of Wisconsin - Madison **Sep. 2021– May 2025**
Bachelor of Science in Electrical Engineering & Computer Science — Minor in Data Science *Madison, Wisconsin*

Relevant Coursework

- Machine Organization & Programming
- Data Structures
- Solid State Electronics
- Signals & Systems
- Circuit Analysis
- Operating Systems
- Digital System Fundamentals
- Real Time Digital Communication
- Operating Systems
- Microprocessor Systems

Experience

UW Space Science & Engineering Center **May 2023 – Present**
Software Engineer Intern *Madison, WI*

- Designed a Printed Circuit Board using Altium for a **power amplifier**, essentially a PI loop to maintain constant current, crucial for the blackbody calibration in the next-generation SHIS instrument, controlled by the Zynq FPGA.
- Implemented **one-wire** communication protocol on an embedded Zybo Zynq system using the DS2480B chip and UARTlite, reducing the requirement for additional communication wires by approximately 50%
- Developed custom firmware, enabling efficient system housekeeping and temperature data collection

Wisconsin Wireless and NetworkinG Systems (WiNGS) Lab **Sep 2023 – Present**
Undergraduate Research Assistant *Madison, WI*

- Designed and implemented a Python script to preprocess data from a 33-node wireless sensor network, transforming raw readings into structured datasets, and utilized visualization techniques to capture variations in CO2 emission
- Collaborating on the development of a mobile spectrum sensing platform, leveraging the Xilinx ZYNQ-7020 FPGA for real-time wireless signal processing across a 70 MHz to 6.0 GHz range, aiming for seamless integration with Android devices.

Terex Utilities Inc **Aug 2023 – Sep 2023**
Trainee *Watertown, SD*

- Completed intensive training at Terex Utilities, gaining specialized knowledge in hydraulics and electrical systems of Terex® Hi-Ranger™ aerial device bucket trucks and digger derricks.
- Acquired hands-on experience in operating various Terex models, focusing on both transmission and distribution line work, and successfully constructed a distribution line from start to finish.
- Enhanced understanding of industry standards through observation of the installation process of multiple units at the factory, with a specific focus on TM-125 unit installation considerations for Indian chassis

Projects

Instrumentation and Data Analysis with DAQ6510 | *Python, Git* **September 2023**

- Established a LAN connection to the Keithley DAQ6510 using socket programming, facilitating real-time interfacing via SCPI commands and ensuring accurate resistance measurements with 4-wire methods and offset compensation.
- Automated data processing by transforming raw instrument readings into structured pandas DataFrames and seamlessly exporting results to CSV for comprehensive analysis and reporting

Badgerloop SolarVec INA Driver | *C++, Mbed Studio* **September 2023**

- Created a custom INA driver using the mbed framework, enhancing precise I2C interfacing for real-time current and voltage sensing in team's solar vehicle.
- Integrated advanced error-handling and calibration routines in the INA driver, bolstering the solar vehicle's power efficiency and assuring consistent performance under diverse operational conditions.

8-Bit Breadboard Computer | *Personal Project* **October 2022**

- Designed and constructed a fully functional 8-bit computer using only simple logic gates
- Enhanced the computer with advanced features including arithmetic functions, memory management, and I/O devices

Technical Skills

Languages: Python, Java, C/C++, HTML/CSS, JavaScript, Matlab
Developer Tools: VS Code, Eclipse, Google Cloud Platform, Mbed Studio, Altium, Vivado, Vitis
Technologies/Frameworks: Linux, GitHub, JUnit, Mbed