Yogesh Sapkota

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Education

Youngstown State University Youngstown, OH

- Masters of Electrical Engineering, GPA 4.0 — May 22 - Dec 23
- Bachelors of Electrical Engineering, GPA 4.0 — Aug 18 - May 22

Skills

- **Programming** : C, C++, Python, VHDL
- **Software** : MATLAB, Simulink, PSpice, LTspice, Altium Designer, KiCAD, Fusion 360, STMCube IDE, Xilinx Vivado, Code Composer Studio, Quartus Prime, Git
- **Hardware** : TI, PIC & STM32 microcontrollers, FPGA, Arduino/ESP32, Raspberry Pi & Pico, Power analyzer and curve tracer, PCB layout and design, Soldering, UART, SPI, I2C

Experience

Electric Vehicle Charging, Signals and Power Solutions, APTIV Warren, OH

Electrical Engineering Intern May 2023 - August 2023

- Design and develop the next generation of testing apparatus for efficient End-of-line testing and debugging solutions
- Managed the complete design cycle of two different PCBAs for the testing apparatus from ideation, schematic entry and PCB layout in Altium Designer to board bring-up
- Expanded the current testing scheme to accommodate and test 6 samples concurrently with update in firmware and hardware using the new-gen PCBAs
- Redesign of the test apparatus resulted in 56 % reduction in the product cost price while elevating the product functionality
- Modified existing C# codebase for a GUI application to allow concurrent testing of multiple samples
- Root-cause analysis and redesign of two PCBAs used in an existing product line
- Schematic design and PCB layout of a new product by adhering to automotive standards & integrating key features

Electrical and Computer Engineering Department Youngstown, OH

Graduate Research Assistant May 2022 - Present

- Researched about versatile implementation of FPGAs in power electronics applications specifically in low frequency inverters for motor drives and high frequency inverters for wireless power transfer
- Design & debug variable frequency Sinusoidal Pulse Width Modulation (PWM) and Space-Vector PWM driver written in VHDL using Xilinx Vivado and implemented on Arty A7 FPGA development board
- Set up experimental fixture with three-phase four-pole squirrel cage induction motor, off-the-shelf inverter modules and FPGA dev board, and collected and analyzed in-rush current as well as current and voltage characteristics under different operating conditions.
- Guide undergrads through their laboratory assignment for instrumentation and computation labs to familiarize them with test bench equipment like Oscilloscope, Function Generator, Programmable DC Power Supply, Digital Multimeter, etc.
- Collaborated with peers in firmware development of a custom sensor tag board and developed SPI driver for ADXL343 accelerometer

Pump and Motor Division, Parker Hannifin Youngstown, OH

Engineering Intern, Research and Development Jun 2021- May 2022

- Perform endurance and performance tests on pumps based on product specifications, analyze test stands readings and characterize and document the nature of faults in pumps and motors
- Build custom circuits in prototyping boards, update and document schematics of changes to the existing circuits
- Implemented custom interfaces in the PanelView application based on the feedback from technicians and assisted in the implementation of electronic controls in the test stands

Projects

- **Battle Bot Project :** Programmed ESP32 using ESP-NOW protocol to establish two-way communication between controller, LEDs and sensors on the battlebot, programmed a touch-display to control the LED patterns and display sensor readings
- **Stepper Motor Driven Toy Car :** Programmed T4MC123GH LaunchPad in C to read ADC inputs from joystick to control the speed and direction, and assembled a makeshift toy car with two stepper motors, motor drivers and joystick module
- **C++ Projects :** Developed and implemented Sudoku Solver, Word-ladder finder, and Pathfinder in C++
- **Digital Circuit Lab Assistant :** Designed and simulated digital circuits using VHDL on Quartus Prime II, programmed DE-10 Lite Board to test the simulated circuits and collaborated with professor to prepare lab handouts and assisted 30 students in diagnosing problems related to Quartus II software

Publications

Harmonic content analysis of a soft starting variable frequency motor drive based on FPGA. Published in: 2023 IEEE 3rd International Conference on Sustainable Energy and Future Electric Transportation (SEFET)