Shovan Shakya

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Education

University of South Florida **Tampa, Florida**

Bachelors of Science in Electrical and Electronics Engineering, 3.55 GPA *December 2024*

Experience

Monterey Bay Aquarium Research Institute **Moss Landing, California**

Computer Vision Intern *June - August 2023*

- Developed OpenCV based realtime disparity and distance estimation tool for fisheye stereo cameras with accuracy range of 5 meters (+- 300 mm) for desktop and VR.
- Integrated FathomNet YOLOv5 deep sea organism tracking model with distance estimation.
- Used Sockets to send realtime frames, and distance information between Python OpenCV application and Unity VR. Integrated OpenCV into Unity using Native Plugins. (C++ DLL)
- Developed pilot-friendly User Interface for VR Unity application.
- Enabled multiprocessing and CUDA for optimal realtime performance.

NBCUniversal **Orlando, Florida**

R&D Software Engineering Intern *September - December 2022*

- Created C# and Python Flask applications for automated parsing of 200+ test files into XML for PLC based simulation
- Verification and Debugging of Ladder Logic for Siemens PLC using TIA Portal.
- Initiated exploration of Brain Computer Interface and Spatial Audio applications for park experiences.(Emotiv, Dolby)
- Deployed project involving a moving prop using stepper motors and microcontroller with other interns.

Center for Assistive, Rehabilitation, and Robotics Technologies **Tampa, Florida**

Research Assistant *May 2022 - Present*

- Integrating Robot Arm, Depth Camera, and LLM in ROS for autonomous operation of tasks for disability assistance.
- Exploring and Implementing RNN, LSTM methods using Pytorch for full body gait prediction from leg markers.
- Designing PCB using KiCAD for ESP32 and IMU for wireless tracking of objects and data transmission.
- Developed driving simulation environment using Unity, controlling Motek motion base. Established low latency communication between between client and motion base using NRF24L01 wireless transceiver.
- Verified and tested project involving calculating impedance using Oscilloscope, LabView, TI C2000, RPi4 and Matlab.

Projects & Technical Clubs

16 Bit CPU on Basys 3 FPGA **(IN PROGRESS)**

- Designing and implementing a 16-bit CPU for a custom instruction set architecture on Basys 3 (Artix-7) FPGA.
- Testbenching, synthesis, and implementation done through Vivado and VHDL.

16 Channel EEG Headset using STM32 **(IN PROGRESS)**

- Designing PCB using KiCAD for STM32.
- Testing Signal Processing and Filters using MATLAB and Python.
- Interfacing TFT display and UART using STM32.
- Researching and implementing hardware and software design for custom EEG headset with team.

USF FSAE, Electrical Team Member **(January 2022 - Present)**

- Developed Schematic design for engine harness along with testing gauges. Deploying, and troubleshooting connections.
- Research and developing Shutdown Circuit for transition to EV. Configuring battery pack system and Accumulator output based on system requirements.
- Soldering, wiring, spot welding batteries & components for IEEE Electrathon electric car.

Student Unmanned Aerial Systems, Electronics & Software Lead **(August 2022 - July 2023)**

- Developed Python application for wireless transfer of drone feed using Ubiquiti Connectivit (UDP) and TS832 (Analog) data from drone camera and raspberry pi to host.
- Developing webserver for displaying IMU info, camera feed for raspberry pi in drone.
- Wrote script for wireless data transmission between LoRA module, microcontroller and NVIDIA Jetson.
- Assigning tasks to team members, conducting performance tests.

Skills

Languages: C, C#, C++, Python, Kotlin, VHDL, Verilog, MATLAB, Ladder Logic
Tools: OpenCV, ROS, PyTorch, KiCAD, Labview, Git, Android Studio, Unity, Vivado, LTSpice, Oscilloscope
Leadership: SASE - Project Director, USF BCI - Vice President