Moteen Shah

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Education

Veermata Jijabai Technological Institute **Mumbai**
Bachelors of Technology in Electronics and Telecommunication Engineering *Feb 2021 - June 2024*

Work Experience

Systems and Networking Lab, NUS Computing **June 2023 - Aug 2023, June 2024 - Present**
WEISER Group - Research attaché *Prof. Ambuj Varshney*

- Developed a highly efficient baseband generator with FreeRTOS scheduling and timing controls.
- **Publication:** Going Beyond Backscatter: Presenting Tunnel Diode Oscillators as a de-facto solution to overcome the drawbacks of backscatter systems.
- Current work: Visible Light Communication, Cluster computing and SIMO based communication using TDO's.

Open Source Developer and Mentee with AOSC **July 2022 - Oct 2022**
Open Source Promotion Plan (OSPP 2022)

- Mainline development of Allwinner D1 SoC based on RISC-V ISA.
- Co-developed drivers such as mmc, gpio, clock, etc to support the new SOC
- **Techstack:** Crosscompilation toolchains, U-Boot, RISC-V ISA, C Programming , Git, Patch based workflow.

Upside Down Labs **Oct 2021 - Dec 2021**
Hardware Design Intern

- Developed a **low-cost ECG monitor** that can be connected into any microcontroller and transmit the output ECG signal to any location in the globe over the internet.
- Developed a **C++ library** for biopotential signal(EMG, ECG, EOG and EEG) processing.
- Developed a **prototype for Bionic hand** that amputees can control at will.

Functional Weeder | ***Raspberrypi, Elixir/Erlang, Robotic Arm Design*** **Oct 2021 - Mar 2022**
Team Leader

- Led my team to **top 12** in All India EYRC under Functional-Weeder theme.
- Implemented **obstacle avoidance and navigation** in a grid for a robot using Elixir a functional Programming Language.
- Developed target detection and payload dropping mechanism.
- Used Phoenix Web framework to establish communication between client and server using Websockets and PubSub.

Projects

Esp32-audio-router | *ESP32, Embedded C/C++, ESPIDF, JS, HTML/CSS* **Sept 2021 – Oct 2021**

- Aim: To route audio from any source to a speaker/headphone using on board bluetooth of ESP32
- Utilised **I2S communication protocol** for sending audio data packets over Bluetooth.
- Deployed **a2dp profile** for Bluetooth.
- Established communication between peripheral components using **Serial and I2C Communication protocols**.
- **Developed communication drivers** for external sound card WM8960 module.

Technical Skills

Languages : Embedded C, C/C++, Python, Elixir, JavaScript.
Frameworks : ESP-IDF, CCStudio, riscv-gnu-toolchain, SmartRF Studio.
Tools : ESP32, MSP430, Linux, Vector Network Analyzers, Logic analyzers, CMake, FPGA, Raspberry Pi, RISC-V, Git, VS Code.

Achievements/Extra-Curriculars

- MobiCom 23 Student Research Competition award winner (undergraduate category).
- **Ex. General Secretary** at Society of Robotics and Automation (SRA), VJTI.
- Led my team to **Top 12 in the All India EYantra Robotics Competition(EYRC)** under the theme - Agricultural Functional Weeder, IIT Bombay.
- Secured **3rd position in Drone Project** conducted by Riders.ai amongst 200+ participants.
- Conducted lectures on **Control Systems like PID Control to over 150 freshmen students** under the Wall-E : Line Following and Self Balancing Robot Workshop.