Brajesh Patil

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Education

VJTI **Jan 2021 – July 2024**
*Bachelor of Technology in Electronics and Telecommunications (**CGPA: 8.29**)* *Mumbai, Maharashtra*

Experience/Internships

Neptunus Power Plant Services Pvt. Ltd. **July 2024 – November 2024**
Management Trainee: Product Design *Navi Mumbai, Maharashtra*

- Automated system setup for Vibox units using **Shell Scripting**, reducing deployment time.
- Streamlined firmware and hardware testing for embedded controllers using **C**, **Python**, and **Shell scripting**, improving efficiency.
- Installed and configured Vibox systems on client ships, managing networking and integration.
- Worked with industrial communication protocols (**4-20mA**, **RS485**, **RS232**, **CAN**, **MODBUS**).

Fractal.ai **June 2023 – August 2023**
Project Intern at CEO's Office *Mumbai, Maharashtra*

- Research on papers exploring the **"Impact of Generative AI on Various Industries"**
- Conducted research on Generative AI's impact across industries to guide strategic investments.
- Implemented a **CNN-based face detection system** using **Python**, enabling employee recognition in-office.

Projects

Linux Kernel Driver for BME280 | *Raspberry Pi, Kernel Modules, Device Tree Overlays* **February 2025**

- Developed a **Linux Kernel Module** for the **BME280** environmental sensor on a **Raspberry Pi 5 (Linux kernel 6.6.74)**.
- Configured the sensor using **Device Tree Overlays** on the **I²C** bus.
- Implemented a **sysfs** interface, enabling users to read **temperature**, **pressure**, and **humidity** data and configure parameters.
- Tested and debugged the driver using standard Linux tools (**Make**, **insmod**, **lsmod**, **dmesg**).

Single Board Computer (SBC) for UAV applications | *SIMA MLSoC, Hardware Design* **March 2024**

- Designed an **SBC** based on the **SiMa.ai MLSoC**, supporting **SLAM**, **VIO**, and **autonomous guidance** for UAVs.
- Developed hardware designs in **Altium Designer**, integrating **Gigabit Ethernet**, multiple **UARTs**, **I2C**, **SPI**, and robust memory (**LPDDR4 DRAM**, **eMMC**).
- Designed **efficient** power management with **dual power inputs** (**USB Type C** and **XT-60**) and multiple voltage rails.
- Developed **GPS**, **GSM**, and **WiFi** modules to ensure reliable operation in **UAV** environments.

Martian Rover for International Rover Challenge | *Arduino MEGA, Embedded C* **January 2023**

- Developed an **in-situ** soil testing module for a rover to **collect** and **analyze** soil samples for signs of life.
- Designed a **PCB** for working of hardware components including a **Nema17 stepper motor**, **drill mechanism**, **actuator**, and integrated sensors (**MLX90614**, **BMP180**, **DHT22**, **SHT20**, **MQ135**) for environmental monitoring.
- Developed an Arduino-based system to automate sample collection, chemical testing, and sensor data integration.

Technical Skills

Languages: C, C++, Python, Java, Shell Scripting
Frameworks: Linux Kernel Modules, FreeRTOS
Technologies: Linux, Raspberry Pi, Arduino, Device Tree Overlays, Git
Developer Tools: VS Code, GDB, GCC, Makefile, vim, nano, Kicad, Altium

Leadership Extracurricular

Vishwa (Astronomy and Space Club of VJTI) **May 2022 – Present**
Electronics Sub-system Member *VJTI*

∗ Managed electronics for **Science Sub-System**, interfacing sensors with the microcontroller.
∗ Delivered a lecture on **C programming** and **Arduino**, focusing on **embedded systems**.

Enthusia (Sports Club of VJTI) **August 2022 – February 2023**
Public Relations Head *VJTI*