# ANIKET SARWADE

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## ACADEMIC QUALIFICATIONS

| Year | Qualification | Institute | CGPA/% |
|---|---|---|---|
| 2020-24 | B.E. (ENTC) | Thakur College of Engineering and Technology, Mumbai | 7.4 |
| 2019-20 | Class XII (CBSE) | Super Thirty Jr. College | 74 % |
| 2017-18 | Class X (CBSE) | River Dale High School | 73% |

## WORK EXPERIENCE

**Light N Light** — **Embedded Firmware Developer** — **Aug 24 – Present**

- Developed **BLE OTA firmware update** for ESP32, optimizing remote software deployment and system stability.
- Implemented **USB-based ESP32 firmware updates**, improving debugging and maintenance efficiency.
- Established a **mesh network using CC1101**(RF Radar Module) **and STM32**, integrating **SIG100 IC and DCB** to transfer data over power lines efficiently.
- Designed **master-slave SPI communication** on STM32, managing multiple slaves for reliable data collection.
- Wrote low-level drivers using STM32 registers to handle **DMX signals and Ethernet-based DMX data acquisition.**
- Integrated **UART and I2C** protocols for sensor communication, ensuring real-time data accuracy.
- Developed a **BLE radar system** to scan for compatible devices, ensuring seamless connectivity. Implemented a detection mechanism to continuously monitor active BLE devices and trigger reconnection protocols if no valid connection is found.
- Developed a **colour science application using Visual Basic WinForms (C++/CLI .NET Framework)** and a **spectrometer** to analyse **live ambient light properties**. Retrieved **data serially from the spectrometer using DLL files** and leveraged it to build logic for **precise light colour adjustments**. Sent **Artnet signals** to achieve desired **CRI, lux, green/magenta shift, and other light properties** for optimized lighting control.
- **Implemented FreeRTOS for real-time task management**, efficiently handling **temperature monitoring, current readings, GUI interaction, BLE data processing, DMX detection, watchdog updates, and OTA update detection**, ensuring optimal system stability and performance.
- **Technologies Used:** ESP32, Raspberry Pi Pico, STM32, UART, USART, LIN, SPI, I2C, BLE, VB, C++, C, Python, Ethernet, RF, OTA Transfer, DMX512, FreeRTOS.

## INTERNSHIP

**IIIT Hyderabad** — **Young Research Fellow** — **Jun 24 – Jul 24**

- Executed **Medical IoT** projects using **NIRS** and **ECG** sensors, achieving seamless sensor integration and reliability.
- Designed a sensor mesh network with **ESP32, ESP-NOW, BLE Mesh**, and **MQTT** for internet-free data transmission.
- Developed **ESP32-based servers** for data publishing using **POST** requests, ensuring confirmation of data receipt (ACK).
- **Technologies Used:** ESP32, ESP-NOW, BLE Mesh, MQTT, UART, I2C, Python, C++, Embedded C, HTTP POST, Sensor Networks, FreeRTOS.

**AM Prototyping Labs** — **Embedded Systems Developer Intern** — **Jan 24 – Jun 24**

- Integrated **NPX heater sensors** using serial communication and dynamic thresholds, enhancing precision & operational efficiency.
- Designed a Constant Pressure Maintainer System with NPX 5050 sensors, DC motors, and solenoids for optimized performance.
- Improved **RFID-based differentiation** by implementing the **UART protocol**, optimizing communication speed and ensuring system functionality.
- Migrated a legacy WinForms application to Qt Creator C++, upgrading user interface and improving overall system performance.
- Developed 3D printing supports using OpenCV, PyMesh, and NumPy, reducing material waste and maintaining structural strength.
- **Used serial log analysis** for **temperature readings and ADC value monitoring**, ensuring data accuracy and system reliability.
- **Implemented FreeRTOS task management**, prioritizing **temperature monitoring, current readings, GUI interactions, and system operations** to optimize performance and real-time response.
- **Technologies Used:** STM32, ESP32, UART, SPI, I2C, RS-232, RS-485, OpenCV, PyMesh, PyVista, NumPy, C++, Embedded C, Python, FreeRTOS, Serial Communication, Qt Creator, Visual Studio WinForms.

**Adani Airport Holdings** — **Intern** — **Jun 23 – Sep 23**

- Designed a **Human Traffic Counter System** using **ESP NodeMCU 8266, PIR sensors, and MySQL**, ensuring accurate real-time data collection.
- Enhanced system performance by integrating **PHP and Node.js**, enabling seamless data analysis and operational efficiency.
- **Used serial log analysis** to monitor and analyze human traffic patterns, improving detection accuracy and system reliability.
- **Technologies Used:** ESP8266, PIR Sensors, MySQL, PHP, Node.js, UART, HTTP POST, Serial Log Analysis, C, Python, Embedded C, Wireless Sensor Networks.

## PROJECTS

- **Hand Gesture Control Robot:** Built Arduino robot controlled via RF-modulated accelerometer data for precision.
- **Temperature-Controlled Water Heater:** Developed Arduino system with user thresholds and automated alerts for control.
- **Smart Irrigation System:** Created IoT-based solution using soil sensors for optimized water usage and agriculture.