

# SHYAM SUNDAR D G



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## CAREER OBJECTIVE

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I am a dedicated individual looking for a career in the reputed organization to secure a challenging position which utilizes my research and engineering skills that can contribute to the company's growth as well as enhance my knowledge by exploring the latest technology to grow professionally.

## PROFESSIONAL EXPERIENCE

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### Senior Software Engineer

(July 2023 - Present)

[Miraфра Technology Private Limited](#)

Bangalore

Currently working as a Senior Software Engineer for the position of Embedded Software at Miraфра Technology Private Limited

### Research Associate-I

(Feb 2021 - June 2023)

[Department of Electronic Systems Engineering,](#)

Indian Institute of Science, Bangalore

#### 1. Project Title: Wi-Fi Modeling and Video Casting

(Feb 2021- Jan 2023)

Worked on Wireless Local Area Network (WLAN) modeling of IEEE 802.11n/ac/ax for indoor and outdoor applications, which is a part of **IISc-Aerospace Network Research Consortium (ANRC)**, along with **Boeing Research Labs**. More details in the [link](#)

The project supervisors were [Neelesh B Mehta](#) and [Chandramani Singh](#).

- Evaluated the PHY layer performance by simulating SNR vs PER for different channel models, spatial streams, and bandwidth for 802.11n and 802.11ac
- Investigated different rate control algorithms (Ideal, DRCA, ARF, and Minstrel-HT), where their performance were evaluated in a dynamic channel conditions
- Minstrel-HT rate control algorithm code was written and integrated in MATLAB-WLAN Toolbox, which was also calibrated and validated referring to NS3 rate control algorithm and Linux driver (ath10k is the mac80211 wireless driver) for 802.11n and 802.11ac
- Performed a System-level simulation of 802.11n to examine the interference of multiple Wi-Fi Networks on the same channel inside an aircraft scenario, by analysing the throughput and packet loss when RTS/CTS, packet aggregation, Block Acknowledgement are enabled with and without Rate adaptation
- Worked on 802.11ax OFDMA scheduler and its optimisation using weighted round robin scheduler

## 2. Project Title: Cyber security of IED devices used in Power Grid Applications (Feb 2023 - June 2023)

Currently working on a project to build security analysis tools for evaluating Intelligent Electronic Devices (IEDs) for possible hardware or software vulnerabilities which are used in Power grid, the project is part of the **Power Grid Corporation of India Limited (PGCIL)**.

The project supervisors are [Chandramani Singh](#) and [Haresh Dagale](#)

- Reverse Engineering and blackbox testing of the IEDs are used to extract and analyse the binary image by using Binary Image Analysis tools like Ghidra, and Binwalk.
- Performed IEC61850 protocol communication using IEDexplorer simulator

## 3. Project Title: Tactile Cyber-Physical Systems

Worked on Edge Intelligence part of the project, which is a part of the **Ministry of Electronics & Information Technology (MEITY)**. The project supervisors were [T V Prabhakar](#) and [Chandramani Singh](#).

- Developed a Tactile Force Sensor Array which is interfaced with Robotiq 2F-85 two finger gripper. The force data is collected using ATmega2560, and is sent back to the haptic device which is remotely operated. This data is used to [intelligently grip](#) a tool by using edge intelligence algorithms.

## 4. Project Title: Bluetooth Low Energy (BLE) based sensor monitoring system for pharmaceutical products.

- Responsible for leading a team in Research and Development of the complete project.
- Designed the custom Rigid and Flexible PCBs for microcontrollers.
- Developed a final product to be compact, with efficient power usage making it fit for the commercial market.

## Electronics Design Engineer

(Sep 2019 – Dec 2020)

Axxonet System Technologies Pvt.Ltd, Bangalore.

Major contribution to the development of multiple medical devices related to Neuroscience in accordance to medical device regulation

- Hands-on experience in interfacing multiple peripherals to an Embedded system like ADC, PMIC, and Battery Management ICs.
- Utilized Altium Designer to its full potential, showcasing proficiency in schematic capture and PCB layout design, ensuring precision and functionality.

## Employee Internship

(July 2019 – Aug 2019)

Axxonet System Technologies Pvt.Ltd, Bangalore.

- Research and Development for the best Instrumentation Amplifier IC having higher Bandwidth.
- Switching Power Supply between an Internal and External Battery without interrupting the operation of the system.

## Summer Internship

(4 weeks)

SIENNA ECAD Technologies Private Ltd, Bangalore.

- Electronic Design Automation with focus on Printed Wiring/Circuit Board Engineering.

## EDUCATION

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**B.E. in Electronics and Communication Engineering, RNSIT, Bangalore. (2015 - 2019)**

**Final year Project:** Internet of Things(IoT) based Smart Healthcare Kit

- The Firmware code was Implemented in Python for Cortex-A53 64-bit SoC (Raspberry-pi). Interfaced with sensors using wired communication protocols (SPI,I2C, single wire/bus). Sensor read values were processed and transmitted using 2.4GHz WiFi.
- The ThingSpeak cloud IoT platform was used for data storage and remote viewing using mobile applications. Alert text messages/sms are sent to specific mobile phone numbers.

## TECHNICAL SKILLS

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**Programming Language:** C, Python and MATLAB

**WiFi Technology:** IEEE 802.11n, 802.11ac, and 802.11ax

**Link Simulator:** MATLAB communication/WLAN Toolbox

**Network Simulator:** ns-3

**PHY/MAC:** Rate control algorithms, CSMA-CA

**Hardware:** ABB REL670 Intelligent Electronic Device(IED), ESP32, ESP8266 Wi-Fi SoC , ATMEGA 328p (Arduino-UNO), Cortex-A53 64-bit SoC (Raspberry-pi), MSP430.

**Software Tools:** MATLAB, Simulink, Wireshark, OpenWRT, Or-CAD Capture, Eagle, Altium Circuit Studio.

## ADDITIONAL INFORMATION

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- Active [volunteer](#) and [committee member](#) for **Indian Institute of Science, Open Day-2023, DESE**
- Awarded, **The Best Hardware Project** for demonstrating Laser Communication System at the college level **Open House Project Expo-2018**
- Awarded, **The Best Hybrid/Embedded Project** for demonstrating Prosthetic Robotic Arm with Gesture Control Instructions at the college level **Open House Project Expo-2017**
- Awarded, **The Best Hybrid/Embedded Project** for demonstrating Smart Home Automation System at the college level **Open House Project Expo-2017**