

# Sreeraj Sudhakaran

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Embedded Software Engineer with **5+ years** of experience in software development, specializing in ARM-based systems, including experience with both bare metal and multi-threaded RTOS environments. Proven track record in delivering industry certified solutions, optimizing firmware for memory-constrained devices, and collaborating with cross-functional teams using Agile/Scrum.

## CORE TECHNOLOGIES

Programming Languages:	C, C++, Python, Assembly language
Communication Protocols:	SPI, I2C, UART, RS232, RS485, WiFi, Bluetooth (BLE), TCP/IP, MQTT
RTOS:	FreeRTOS, experience with schedulers
Debugging Tools:	Oscilloscopes, Multimeters, Logic Analyzers and Soldering skills
Microcontrollers:	STM32, AVR, PIC, Quectel, ESP32
Software Tools:	VS Code, Keil uVision, AVR Studio, Proteus, OrCAD, STM32CubeMX, Eclipse, Renode
Version Control & Management Tools:	GitHub, GitLab, Jira, ClickUp

## EXPERIENCE

### Software Engineer | Viral Nation, Toronto, Canada (Aug 2022- May 2024)

- Developed and implemented a new architecture process for handling multiple data sources, reducing fetching times by 30%, increasing overall system stability.
- Engineered real-time data processing algorithms and APIs using multiple queue management solutions, resulting in a 40% improvement in overall system responsiveness and data handling efficiency.
- Streamlined configuration management processes, enhancing collaboration and reducing deployment errors.
- Implemented Prometheus/Grafana for real-time monitoring, cutting system downtime by 25% through proactive issue detection.
- Crafted comprehensive documentation, accelerating onboarding time by 50% and improving team scalability.
- Automated routine tasks with custom scripts, streamlining log analysis, and performance benchmarking, saving 8 hours of manual work per week and increasing team efficiency.

### Embedded Software Engineer | Beginow, Trivandrum, India (May 2017- May 2021)

- Led SDLC involvement from requirements gathering to deployment for embedded GPS tracking devices, ensuring on-time product launches and feature delivery.
- Spearheaded technical leadership for product feature research and development.
- Conceptualized IoT devices incorporating MQTT for communication and integrated power monitoring system.
- Optimized firmware and developed low-level device drivers for STM32, PIC, and AVR microcontrollers, ensuring functionality and reliability.
- Innovated advanced algorithms for automated network switching, optimizing cellular data usage and improving overall system performance by 30%.
- Constructed Bluetooth (BLE) interfaces and TCP/HTTP server-side APIs for real-time device configuration.
- Executed rigorous testing and debugging of hardware components using oscilloscopes and logic analyzers.
- Collaborated closely with cross-functional teams throughout the product development lifecycle, authoring clean, well-documented code and providing valuable insights during design reviews and code walk-throughs.
- Liaised with clients to gather technical documents and keeping them aligned with industry standards, resulting in 97% client satisfaction rate.
- Proactively identified and implemented improvements to flash memory data storage, enhancing data integrity.

## PROJECTS

### 1. STM32-based Vehicle Tracking and Monitoring System

- Directed design and implementation of vehicle tracking devices, adhering to AIS 140 standards, resulting in 100% compliance.
- Integrated MEMS sensors for real-time monitoring of vehicle dynamics.
- Crafted priority and non-priority alerts using ISRs, reducing response time by 60%.
- Refined firmware for low-power ARM processors, decreasing power consumption by 25% while improving performance by 35%.

### 2. Quectel-based Vehicle Tracking and Monitoring System

- Architected real-time GPS tracking and geofencing capabilities, ensuring 40% uptime for remotely deployed systems.
- Achieved 30% more storage for tracking log data through efficient memory management techniques.
- Ensured compliance with industry standards, leading to successful deployment and customer satisfaction.

### 3. PIC18-based Speed Governing System

- Developed speed control system using ADC and PWM-based mechanisms, improving speed regulation accuracy by 45%.
- Enhanced functionality and performance in V2 by incorporating feedback and testing results from V1, resulting in a 30% reduction in user-reported issues.
- Developed a Bluetooth (BLE) and TCP/IP server-side interfaces, for real-time adjustments to maintain target speeds under varying conditions.

### 4. ATmega328-based Information Board Controllers

- Successfully migrated assembly-based firmware to C-based firmware, reducing code complexity by 60%.
- Engineered and optimized schematic designs and PCB layouts for updated controller boards, resulting in a 40% reduction in board size.
- Performed board bring-up and improved signal integrity through strategic component placement and routing techniques.

## EDUCATION

- **Bachelor of Engineering** in Electronics and Communication Engineering (Sep 2012 – Jun 2016)  
Visvesvaraya Technological University, India
- **Post Graduate Diploma** in Advanced Embedded System Design (Jul 2016 – Jan 2017)  
Keltron Knowledge Centre, India
- **Post Graduate Diploma** in Artificial Intelligence and Machine Learning (May 2021 – Dec 2022)  
Lambton College, Toronto, Canada