**Preenu Ann Ponnachan**

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🔗<http://www.linkedin.com/in/preenu-ann-ponnachan-70674312a> |

💻 <https://github.com/preenu91> | UK-based (Skilled Worker Dependant Visa – no sponsorship needed)

# PROFESSIONAL SUMMARY

Embedded Software Engineer with 3+ years of experience building reliable firmware solutions using **C/C++, STM32, FreeRTOS,** and **Linux.** Expertise in driver development, real-time systems and hardware-software integration. Proficient in debugging, performance optimization, to deliver robust embedded solutions. Recently deepened skills in Modern C++ and Linux kernel development through independent projects and open-source contributions. Now seeking to contribute to innovative embedded systems teams with proven debugging and optimisation capabilities.

PROGRAMMING SKILLS

* **Languages:**  C, C++, Embedded C, Python
* **Platforms & OS:**  STM32, FreeRTOS, Linux
* **Frameworks & APIs:**  Qt (GUI, signals/slots), IPC, multithreading
* **Tools:**  Git, SVN, Jira, Confluence, cppCheck, GDB, Valgrind, TestRail, MATLAB
* **Peripherals:** SPI, I2C, UART, GPIO, DAC, Timers, ADC
* **Build Systems:** Makefile, CMake
* **Database:** SQLite

EXPERIENCE

**Eaton MTL**

### Software Engineer, Aug 2022 – June 2024

* + Developed and Integrated Direct Digital Synthesis (DDS) on STM32 microcontrollers, enhancing audio tone accuracy and increasing system test reliability by improving signal validation with oscilloscope measurements.
  + Developed a Python automation script to control hardware power device via smart plug, reducing manual testing time significantly.

**Gadgeon Systems Inc**

### Software Engineer, May 2020 - Dec 2020

* + Developed and optimized device drivers in Embedded C for STM32 peripherals (SPI, I2C, UART), ensuring stable sensor communication.
  + Implemented FreeRTOS-based firmware applications in Embedded C including GPIO button interfacing with debouncing logic.
  + Debugged and flashed firmware using ST-Link/JTAG; validated communication with Tera Term for command-based testing and logging.
  + Conducted POC research on LoRaWAN protocol, Cantata, and SonarQube for client projects.

**Inntot Technologies**

### Software Engineer, Aug 2018 - Mar 2020

* + Designed and developed Internet Radio software on Linux from requirements to deployment in C with Qt-based GUI development in C++.
  + Integrated SQLite and third-party libraries (mpg123, FDK AAC) for full functionality.
  + Deployed IPC mechanisms like shared memory, pipes, and semaphores for embedded systems.
  + Conducted unit testing and integration on Raspberry Pi platforms.
  + Monitored multi-threaded application performance using Linux tools (top), optimizing CPU usage and system efficiency.

INDEPENDENT LEARNING AND CONTRIBUTIONS (July 2024- Present)

* Upskilled in **Modern C++** (advanced features, templates, STL containers) and **Linux kernel development** through structured self-learning.
* Developed a **Virtual I2C Bus Simulation** in Modern C++ with CMake, demonstrating OOP design, register-based communication, and embedded systems knowledge <https://github.com/preenu91/VirtBusCPP>
* Contributed to **Cppcheck** open-source project, improving documentation and tool usability

[https://github.com/danmar/cppcheck](https://github.com/danmar/cppcheck))

# EDUCATION

* **University of Hertfordshire, Hertfordshire, UK** (2021 –2022)

Master of Science in Data Science and Analytics

* **Mahatma Gandhi University, Kerala, India** (2014-2016)

Master of Technology in Advanced Communication and Information Systems; Distinction

***Academic Thesis & Publication****:* *Comparison of PAPR Reduction Techniques in OFDM Systems* using MATLAB – modelled and simulated communication systems for performance analysis; published in IEEE ICCES 2016.

* **Mahatma Gandhi University, Kerala, India** (2009-2013)

Bachelor of Technology in Electronics and Communication; Distinction

TRAINING & CERTIFICATIONS

**VectorIndia - Embedded Systems Trainee** (Jan 2018 – July 2018)

* Completed an intensive 6-month program focusing on C/C++, Embedded C, RTOS, ARM, Linux.
* Gained practical, hands-on experience by completing real-time projects.