Harshvardhan R

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EDUCATION

- **Vellore Institute of Technology, Chennai** — *2022 – Present*
  Bachelor of Technology in Electronics and Computer Engineering — *CGPA: 9.23*

- **Senior Secondary Education (CBSE)** — *2022*
  Central Board of Secondary Education — *Percentage: 89.8*

EXPERIENCE

- **Embedded Systems Trainee (Cohort 3) – Infineon Technologies** — *Sep 2025 – Dec 2025*
  - Completed a rigorous, industry-grade embedded systems training program conducted by Infineon engineers, focused on **bare-metal** firmware development
  - Developed embedded bare-metal firmware for an **ARM Cortex-M0+** microcontroller (Infineon PSoC 4100S Plus), implementing **GPIO, TCPWM timers, PWM, SAR ADC**, and **interrupt handling** at register level
  - Built and debugged the complete firmware stack by designing **startup code, linker scripts, and Makefile-based builds** using the **GCC toolchain**, and debugging with **GDB** and **OpenOCD** to analyze memory maps, stack usage, and interrupt execution flow

- **Embedded Systems Intern – DRDO (Gun Health Monitoring System)** — *May 2025 – Jun 2025*
  - Developed real-time firmware for acquisition and diagnostics of weapon subsystem signals
  - Implemented low-level embedded firmware on the **NXP MPC5674F** using **S32 Design Studio**, configuring **eQADC, DMA-driven eSCI (UART), FlexCAN, PIT timers, system clocks, NVSRAM**, and **interrupt service routines** for deterministic multi-channel data acquisition
  - Verified **interrupt timing** and **ADC sampling behavior** by instrumenting firmware with GPIO toggles and validating delays via **oscilloscope**-based signal probing

PROJECTS

- **Auto Street Lamp Control System – Infineon Hackathon (3rd Place)** — *Dec 2025*
  GitHub: https://github.com/hrsas/Infineon-Hackathon
  - Engineered **LDR**-based illumination control with progressive activation of **9 LEDs** for day–night simulation
  - Designed a **multi-rate bare-metal firmware** on the **PSoC 4100S Plus** by leveraging dual **TCPWM timers** to decouple **ADC sampling (1 kHz)** from **LED control updates (100 Hz)**, with interrupt-driven control and deterministic clock configuration

- **Bare-Metal Analog Joystick** — *Dec 2025*
  GitHub: https://github.com/hrsas/psoc4100sPlus-baremetal-analog-joystick
  - Implemented a **game controller** by converting potentiometer position into discrete LEFT/RIGHT control commands and transmitting them to a PC game over **UART**
  - Designed a **timer-driven** bare-metal firmware on the **Infineon PSoC 4100S Plus**, configuring **SAR ADC**, **TCPWM interrupts**, **GPIO routing**, and **SCB UART** via register-level programming

- **Wearable Fitness Watch** — *Jan 2025 – May 2025*
  GitHub: https://github.com/hrsas/SmartFitnessWatch
  - Built and programmed an **ESP32**-based embedded fitness tracker for heart-rate monitoring, step counting, and workout tracking
  - Integrated **MPU6050 IMU** and **MAX30102** heart-rate sensor; engineered **dynamic threshold calibration**, significantly improving motion-detection consistency and repetition-count reliability

CERTIFICATIONS

- **Etalvis Certifications:** C Programming Foundation, Electronics Foundation, Embedded Hardware, Embedded Software (GPIO, Controller), Microprocessors Internals, ARM Foundation

Certificates: Drive Link

ACHIEVEMENTS

- **3rd Place -** Infineon Embedded Systems Hackathon — *Sep. 2025 - Dec. 2025*
- **Top-5 Finalist out of 1000+ teams** at DVCon India 2025 — *Feb. 2025 - Aug. 2025*

TECHNICAL SKILLS

Embedded Systems: Bare-metal firmware, ARM Cortex-M, GPIO, NVIC, interrupts, timers (TCPWM, PIT), PWM, ADC (SAR ADC, eQADC), DMA, UART, SPI, I2C, CAN

Programming: C, C++, Embedded C

Tools: GCC toolchain, linker scripts, GDB, OpenOCD, S32 Design Studio, Git, Linux