# Jonathan Sunil Thomas

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## Summary

MTech student in Embedded Systems with expertise in firmware development, embedded Linux, and real-time operating systems. Eager to apply my skills to innovative and efficient embedded solutions.

## Education

**Vellore Institute of Technology** — Vellore, TN
*MTech in Embedded Systems; CGPA: 8.38/10* — *July 2024 – Present*

**APJ Abdul Kalam Technological University** — Kerala, India
*BTech in Electrical and Electronics Engineering; CGPA: 7.77/10* — *Sept. 2020 – June 2024*

## Technical Skills

**Programming & FPGA Development**: Embedded C, C++, VHDL, Python, Shell Scripting
**Operating Systems**: Embedded Linux, VxWorks, FreeRTOS
**Tools**: Xilinx Vivado, MATLAB, Simulink, Keil µVision IDE
**Communication Protocols**: I2C, SPI, UART, CAN, 5G, BLE
**Microcontrollers & Processors**: Raspberry Pi, NodeMCU, Arduino, ARM

## Experience

**Research Intern** — Aug. 2023 – Sept. 2023
*International Institute of Information Technology (IIITH)* — *Hyderabad, India*
- Designed and implemented 10+ smart city nodes using oneM2M and NodeMCU, improving real-time data transmission efficiency by 30%.

**Team Member** — June 2022 – May 2023
*E-Wouk Racing 2.0* — *India*
- Led design and manufacturing of an All-Terrain Vehicle for SAEINDIA national competition, managing fabrication team to optimize performance and durability.

## Academic and Research Projects

**IoT Wearable Device for Mental Health & Stress Monitoring** — Aug. 2024 – Present
- Simulated sensor data acquisition with cloud integration via HTTP protocol in MATLAB.
- Developed and trained ML model for stress classification with 98% accuracy.
- Designed wearable sensor prototype with cloud integration.

**Agrorover – Crop Leaf Disease Detection Rover** — Jan. 2024 – May 2024
- Developed autonomous navigation algorithm using ROS for path planning.
- Integrated embedded Linux for real-time decision-making.

**FreeRTOS Based Secure IoT System for Agriculture Monitoring** — Aug. 2024 – Present
- Implemented UART-based real-time debugging to monitor and optimize sensor data with cloud-integrated logging.

## Publications

**IoT Wearable Devices to Detect and Monitor Mental Health and Stress** — Jan'25
- **Accepted at:** SENNET 2025 – Wearable IoT-based solution for stress detection and monitoring using multi-sensor data and ML classification.
- **Specifications:** GSR, infrared temperature, ECG, accelerometer with ESP32; ThingSpeak cloud; MQTT real-time communication; XGBoost classifier with 98% accuracy.
- **Novelty:** Combines physiological and behavioral parameters with ML in a wearable form factor for continuous monitoring.

## Certifications

Verilog HDL: VLSI Hardware Design Comprehensive Masterclass – Udemy (2025)
Mastering Microcontroller and Embedded Driver Development – Udemy (2025)
The Joy of Computing using Python – NPTEL (2022)