HETAL MEGHNATHI

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EDUCATION

Vishwakarma Government Engineering College, Ahmedabad, IN **June 2022**
Bachelor of Electronics and Communication Engineering.

EXPERIENCE

IndieSemiC Ahmedabad IN
Embedded Firmware Engineer **Aug'23 - Mar'25**

- Developed and optimized custom Linux drivers and kernel modules (GPIO, SPI, I2C, high-speed interfaces) for i.MX93 EVK, customizing Yocto-based system images to improve boot performance, stability, and industrial automation. Led SoC board bring-up, configuring device trees, bootloaders (U-Boot, Barebox), and peripherals for seamless hardware-software integration.
- Designed and worked on Raspberry Pi-based LoRaWAN and asset tracking gateways, leading firmware, hardware integration, cloud connectivity, and production readiness for industrial and IoT applications.
- Engineered Zephyr RTOS drivers and optimized firmware for I2C, UART, SPI, BLE, Wi-Fi, and LoRa, improving power efficiency and real-time communication. Implemented Matter, OpenThread, and BLE Mesh, enhancing RF communication for smart home and IIoT.
- Led multiple product development projects, working with NXP (i.MX series), Raspberry Pi, BeagleBone, and Nordic SoCs. Collaborated on schematics, board bring-ups, debugging, and customer-specific solutions from prototype to production.

Consciente.io Hyderabad IN
Firmware Intern **Feb'22 - April'22**

- Applied ROS, Docker, and Azure IoT Hub technologies in industrial automation, enhancing system interoperability and efficiency.
- Conducted extensive research on material selection and 3D printing technologies, achieving a 20% cost reduction and a 15% improvement in product efficiency.

Gujarat Technological University Robotics Club Ahmedabad, IN
Circuitry Technical Core Team Member (ECE) **Aug '19 - Dec'21**

- Engineered real-time navigation and control stack for autonomous robots using PID controllers & Kalman filters (Arduino Mega/ESP32), improving sensor fusion accuracy by 30% and trajectory stability in dynamic environments.
- Developed & optimized embedded firmware for motor drivers, actuators, and multi-sensor networks (I2C/PWM/analog), achieving 45% faster system responsiveness and higher operational efficiency.
- Mentored and led a team of 40+ members during ABU Robocon 2021, delivering hands-on training in embedded system design, control algorithms, and firmware development. This collaborative effort strengthened hardware-software integration, optimized robotic systems, and secured a position in top 10 on international abu robocon competition.

PROJECTS & ACTIVITIES

Hospital Management System – MedEc (Smart Nurse) **Aug'18 - Jul'21**

- Engineered an AI-integrated smart nursing robot for post-operative patient monitoring, automating medication administration and reducing the risk of medical negligence.
- Leveraged real-time sensors, image processing, and embedded systems programming to enhance patient care and streamline healthcare workflows, improving efficiency by 15%.

Automation & PCB Design **July 2019**

- Designed and troubleshoot electronic circuits for industrial applications, focusing on sensor-based control systems and embedded programming to automate processes and improve system reliability.

Machine Learning & AI – IIT Roorkee **Sept 2019**

- Implemented machine learning models for image classification using Stochastic Gradient Descent and Random Forest classifiers, applying Python libraries like Scikit-learn and Matplotlib for data analysis and model training.

IEEE VGEC **Feb'19 - Mar'20**

- Managed event logistics, budgeting, and coordination for the IEEE VGEC student chapter, organizing technical events and workshops to engage and educate the academic community.

SKILLS

Programming Languages: C, C++, Python, MATLAB, Embedded C
Embedded Systems: Linux Kernel, Yocto, Zephyr RTOS, Firmware Development
Communication Protocols: SPI, I2C, UART, BLE, Wi-Fi.
Development Tools: Visual Studio, Git, OpenCV, PyCharm, NumPy, Pandas, Scikit-learn, JTAG Debugging