Kartikeya Arvind Yadav

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SUMMARY

Embedded Systems Engineer with 3 years of experience in firmware development and system-level testing. Proficient in UEFI/BIOS validation, ARM-based platforms, and Windows on ARM diagnostics. Skilled in interface testing (UART, SPI, I2C, ADC, DAC), sensor calibration, hardware bring-up, and real-time performance analysis. Passionate about low-level development with mentoring experience in Linux and embedded systems

TECHNICAL SKILLS

- **Languages & Frameworks:** C, C++, Python, Embedded C, Java, Shell, CMake, FreeRTOS, Zephyr, Embedded Linux
- **Microcontrollers & Platforms:** Raspberry Pi 3b, 4, 5, ESP32, STM32, ARM Cortex-M/A series, Toradex Apalis iMX6/iMX8, Colibri iMX6ULL/VF50/VF61, PlatformIO, ESP-IDF, Arduino
- **Protocols & Interfaces:** MQTT, TCP/IP, UDP, I2C, SPI, UART, BLE, 802.11 protocols (a/b/g/n/ac/ax), WPA2/WPA3, NFC, Bluetooth, 4G/5G, GPS, Ethernet, PCIe, VoIP, SIP
- **AI/ML Tools & Frameworks:** Python (scikit-learn, PyTorch, TensorFlow), LSTM, Deep Q-Learning, OpenCV, SUMO, Gym, NumPy, Pandas, TensorBoard, Model Evaluation (MAE, RMSE, MAPE, R^2), Curriculum Learning
- **Cloud & DevOps**: Bash, Yocto, QEMU, AWS IoT Core, OTA Updates, Git, CI/CD, Docker,
- **Debug & Validation:** JTAG, Oscilloscope, Logic Analyzer, Multimeter, EMI/EMC Testing, Board Bring-up
- **Tools & Utilities:** Linux (Ubuntu, Embedded), Windows, VS Code, JetBrains IDEs, Jira, Wireshark, Schematic/Layout Review (PADS, Cadence), Mobile App Integration (BLE)

EDUCATION

M.S. in Computer Science, Drexel University, Philadelphia, PA — GPA: 3.89 Sep'23 - Jun'25

Bachelor of Technology in Electronics and Communication Eng, Shiv Nadar University, Delhi, India Jun'17 - May'21

WORK EXPERIENCE

Jitsik LLC — *Graduate Co-op Intern, Software and Sensor Development,* Philadelphia, PA Sep'24 - Dec'24

- Optimized IMU sensor performance for a VR driving simulator, refining motion tracking accuracy and sensor calibration for various vehicle configurations
- Enhanced system robustness by refactoring C++/C# code and developing immersive VR scenarios in Unity for a more realistic simulation

Smith+Nephew — *R&D Intern - Software Engineering,* Andover, MA June'24 – Aug'24

- Developed multi-threaded applications for connected medical devices, ensuring efficient data processing and secure real-time communication
- Utilized AWS IoT, Lambda, and DynamoDB to manage device data, enabling real-time monitoring, cloud integration, and seamless data storage for connected healthcare solutions

Champion Semiconductor LLP GEOCON — *Embedded Software Engineer,* India Jan'21 – May'23

- Engineered firmware and embedded applications for ARM/x86 Single Board Computers (SBCs), optimizing low-level hardware interactions
- Led UEFI/BIOS development using EDK2 framework, customizing bootloader configurations and creating Board Support Packages (BSPs) to streamline hardware integration
- Spearheaded SBC hardware bring-up, debugging hardware initialization issues and ensuring smooth boot-up processes
- Mentored interns in Linux fundamentals and embedded system development, fostering hands-on experience in flashing, debugging, and system configuration

KEY PROJECTS

- **Passenger Announcement System** – Developed a VoIP-based emergency communication platform and an IP-based public announcement system for real-time train broadcasts, ensuring clear and reliable passenger communication
- **Driver Fatigue Monitoring System** –Implemented facial landmark detection for real-time drowsiness and yawning recognition, integrating automated alert mechanisms to improve driver safety in military applications
- **OSA-SAM Radar UI Retrofit** – Modernized legacy radar display systems by developing a Qt and OpenGL-based UI, enabling digital visualization of incoming data for improved operational efficiency
- **RFID Tag Reader for Marathons** – Designed and developed an RFID-enabled tracking system to provide real-time monitoring of marathon runners, combining a Qt-based GUI with a Java backend for seamless data processing

ACHIEVEMENTS & CONFERENCES

- **Safety 21** – Presented the MetaDrive simulator developed at Jitsik for driving education
- **Electronica India 2022** – Exhibited embedded solutions developed by Champion Semiconductions at India's leading electronics event
- **Presentation on Driver Fatigue Monitoring System Prototype** – Presented a driver fatigue monitoring prototype to the Indian Air Force, showcasing sensor integration and real-time alerting
- **Music Performance Certifications** – Level 5 (Electronic Keyboard), Level 2 (Piano) – Trinity College London
- **Upsilon Pi Epsilon** - Inducted into Upsilon Pi Epsilon (UPE) for academic excellence and leadership in computing and information disciplines