Pranav Kumar

Personal-Site | pranavkumar083@proton.me | linkedin.com/in/pranav083 | +1-540-934-8078 | Virginia, USA

Education

Virginia Tech — Virginia, USA
MS in Computer Engineering — *3.9/ 4 GPA August 2024 – May 2026*

UIET, Panjab University — Chandigarh, IN
B.E in Electronics and Communication Engineering — *May 2016 – Sept. 2020*

Job / Research Experience

SSRG Lab @Virginia Tech — Linux, Kernel, Compilers, LLVM, Docker
Graduate Student Researcher — *Dec 2024 - Present, VA, USA*

- Developing an indirect call mechanism for binary decompilation under **Prof. Binoy Ravindran**.
- Exploring LLVM IR for low-level **code optimization for unused link** in large codebase.

ARTPARK @IISc, Bangalore — Arm4, BLDC-drivers, STM32, TI, CAN, FOC, ROS
Embedded System Engineer — *May 2023 – July 2024, Bangalore, IN*

- Worked Under Supervision of **Prof. Shishir N.Y.** on quadruped robot development.
- Developed **firmware & hardware architecture** for using FreeRTOS.
- Built a **low-latency, fault-tolerant communication stack** (CAN, ROS) for synchronized motion control.

Flux Auto Pvt. Ltd. — ARMm7,BMS, FreeRTOS, BLDC, CAN, I2C, ROS
Embedded System Engineer — *June 2021 – March 2023, Bangalore, IN*

- Developed autonomous systems and retrofit kits for vehicles, including off-road **Tractor** and industrial machinery.
- Designed deployable firmware with decentralized multi-node **CAN communication**.
- Developed **custom IC drivers & middleware**, optimizing **hardware-software integration**.

Futuristic Labs Pvt. Ltd. — ARMm4, FreeRTOS, esp-idf, I2C, UART, Mqtt
Embedded Firmware Engineer — *Jan. 2020 – May 2021, Hyderabad, IN*

- Developed **RTOS-based firmware** for an **IoT-driven autonomous cooking machine**.
- Built **seamless embedded communication** between **real-time controllers & compute modules**.
- Optimized **interrupt-driven** firmware to enhance system responsiveness and efficiency for thermal control.

Technical Skills

Languages: C, C++, Python, Embedded C, Embedded Linux, Linux
Hardware Protocols: ARM, I2C, SPI, CAN, UART, BeagleBone, Compute Modules, ESP32
Developer Tools: Git, Docker, ROS, FreeRTOS, AUTOSAR
Hardware : STM32H7x, TI, Steppers, BLDC, FOC, Xilinx FPGA Spartan etc.
Familiar: Algorithms, LaTeX, Shell, Yocto, TCP/IP

Long Term Project

Google Summer Of Code(GSOC) — Device Tree, Kernel Module, PRU, ARMa8, Embedded C
BeagleBoard.Org(Open Source Contributer) — *June – Aug. 2019, Chandigarh, IN*

- Using BeagleBone and 74hc299 shift Register, provided a reference design for bi-directional commincation for multiple peripherials see Project **Page** and Beaglebone official blog **Page**, **Playlist** and **Github Repo**.

Research Work

- "Autonomous System of Heavy Vehicle Using CAN Networking" **Link** at **ICDEMI**, Bangalore through Springer - Nov 2024

Achievements And Awards

- 2019 – Robot Operating System Conference **ROSCon-19, Macau, China Scholarship Holder**.
- 2019 – Awardee for excellence in Technology field by **Mrs. Kirron Kher (MP, Chandigarh)**.
- 2019 – Got **1st** Award at Design and Idea Competition by IIC, Panjab University at Chandigarh.
- 2019 – **Mentor** of winning team at **Smart India Hackathon-2019** by **Kokuyo Camlin** at IIT Hyd.
- 2021-2022 – Three times winner of Best Employee per Quarter at **Flux Auto**.

Note: All the **Underline** text are Clickable Links.