

PRANAV Kumar

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Education

Virginia Tech

MS in Computer Engineering

UIET, Panjab University

B.E in Electronics and Communication Engineering

Virginia, USA

3.9/ 4 GPA August 2024 – May 2026

Chandigarh, IN

May 2016 – Sept. 2020

Job / Research Experience

SSRG Lab @Virginia Tech

Graduate Student Researcher

Linux, Kernel, Compilers, LLVM, Docker

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

Embedded System Engineer

Arm4, BLDC-drivers, STM32, TI, CAN, FOC, ROS

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.

Embedded System Engineer

ARMm7,BMS, FreeRTOS, BLDC, CAN, I2C, ROS

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.

Embedded Firmware Engineer

ARMm4, FreeRTOS, esp-idf, I2C, UART, Mqtt

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, MISRA C++, ROS,MATLAB

Hardware : STM32H7x, TI, Steppers, BLDC, FOC, Xilinx FPGA Spartan etc.

Familiar: Algorithms, L^AT_EX, Shell, Yocto, TCP/IP

Long Term Project

Google Summer Of Code(GSOC)

BeagleBoard.Org(Open Source Contributor)

Device Tree, Kernel Module, PRU, ARMa8, Embedded C

June – Aug. 2019, Chandigarh, IN

- Using BeagleBone and 74hc299 shift Register, provided a reference design for bi-directional communication for multiple peripherals 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.