

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

Docker, Compilers, LLVM, indirect Call

Dec 2024 – Present, VA, USA

- Developing an indirect call mechanism for binary decompilation under **Prof. Binoy Ravindran**.
- Exploring kernel-level instrumentation and low-level code optimization for enhanced performance.

ARTPARK @IISc, Bangalore

Embedded System Engineer

Emb. Linux, ARM, STM32, BLDC, CAN, ROS

May 2023 – July 2024, Bangalore, IN

- Designed low-level drivers and communication stacks for quadruped robotics.
- Developed custom firmware for motor controllers (FOC, BLDC), optimizing real-time performance.
- Implemented high-speed CAN protocols for real-time control in embedded Linux systems.

Flux Auto Pvt. Ltd.

Embedded System Engineer

ARMm7, FreeRTOS, STM32, TI MCUs, CAN

June 2021 – March 2023, Bangalore, IN

- Built low-level peripheral drivers for autonomous vehicle retrofit kits (tractors, industrial machinery).
- Designed real-time firmware for multi-node CAN networks, ensuring robust distributed control.
- Developed RTOS-based bootloader and system diagnostics for seamless firmware updates.

Futuristic Labs Pvt. Ltd.

Embedded Firmware Engineer

Emb. Linux, RTOS, OpenCV, Docker, MQTT

Jan. 2020 – May 2021, Hyderabad, IN

- Created device drivers and firmware abstraction layers for IoT-integrated autonomous systems.
- Developed kernel-space and user-space communication bridges for real-time data exchange.
- Optimized interrupt-driven firmware to enhance system responsiveness and efficiency.

Technical Skills

Languages: C, C++, Python, C, Linux, LLVM, Compiler

Hardware Protocols: ARM, I2C, SPI, CAN, UART, BeagleBone, Raspberry Pi ESP32

Developer Tools: Git, Docker, MqTT, ROS, FreeRTOS, AUTOSAR

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

Familiar: Algorithms, L^AT_EX, Shell

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.