

# PRANAV Kumar

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## Job / Research Experience

### ARTPARK @IISc, Bangalore

*Embedded System Engineer*

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

*May 2023 – July 2024, Bangalore, IN*

- Working Under Supervision of Asst. Prof. Shishir N. Y. Kolathaya
- Development of System design of Quadraped robot.
- Development of firmware and hardware of legged robot.
- Responsible for the development of Communication stack of robot.
- Worked with team on the development of BLDC motor driver of Actuator.

### Flux Auto Pvt. Ltd.

*Embedded System Engineer*

ARMm7, FreeRTOS, EclipseIDE, STM32, TI, BLDC, CAN, I2C, ROS

*June 2021 – March 2023, Bangalore, IN*

- Development of Generic solution for making retrofit kit for vehicle to make it autonomous.
- Worked on Software and Hardware solution for Off-road Tractor and Industrial vehicle.
- Working with embedded systems to have complete deployable system on device.
- Development on multi-node decentralize CAN system for Off-Road vehicle.
- Development on autonomous system for Industrial vehicle (Fork-lift, BOPT etc.)
- Writting library and driver for different ICs.

### Futuristic Labs Pvt. Ltd.

*Embedded Firmware Engineer*

ARMm4, FreeRTOS, esp-idf, OpenCV, Stepper, I2C, UART, Docker, Mqtt

*Jan. 2020 – May 2021, Hyderabad, IN*

- Worked on autonomous cooking Machine(for Indian Cuisine) Firmware and embedded design .
- Development of embedded solution form different Hardware and IOT based appliances.
- Development of bridge between RTOS Board and Compute Module.
- Working with embedded systems with safety constrain in it realted to thermal etc.

## Technical Skills

**Languages:** C/C++, Python, Embedded C, OpenCV, Embedded Linux, Linux

**Hardware Protocols:** ARM, I2C, SPI, CAN, Modbus, UART, BeagleBone, Compute Modules(Rpi CM4), ESP32

**Developer Tools:** Git, Docker, TravisCI, LvGL, MqTT, ROS, FreeRTOS

**Hardware :** STM32H7x, STM32G4x, TI, Steppers, BLDC, FOC, Xilinx FPGA Spartan etc.

**Familiar:** Algorithms, L<sup>A</sup>T<sub>E</sub>X, Shell, Yocto, ESP-IDF

## Education

### Virginia Tech

*MS in Computer Engineering*

Virginia, USA

*3.9/4 GPA August 2024 – May 2026*

### UIET, Panjab University

*B.E in Electronics and Communication Engineering*

Chandigarh, IN

*May 2016 – Sept. 2020*

## Relevant Coursework

Basic Electronic Devices and Circuits, Operating Systems, Computer Architecture, Data Structure and Algorithm, Microprocessors and Microcontrollers, Digital Electronics, Verilog, Linear Integrated Circuits and its Applications (IC), Switching Theory and Logical Design, Digital Signal, Computer Network, Processing (DSP), Digital Control Systems

## Research Interest

Autonomous systems design, Electronic Devices and Circuits, Digital Electronics, Robotics, Computer Architecture for a variety of emerging Applications, Programmable Logic (FPGA), Embedded System Design, Computer Hardware Design, Switching Theory and Logical Design, Microprocessors and Microcontrollers, Programming Electronic Controller Drives, Digital Control Systems

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## Internship/Long Term Project

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### 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.
- For more Information see Project [Page](#) and Beaglebone official blog [Page](#).
- Youtube [Playlist](#) and Github [Code](#).

### Embedded Product development for Saksham Creative Edu.(NGO)

Student Coordinator

Atmel, I2C, Team Managing

Sept.– Dec. 2018, Chandigarh, IN

- Worked as Embedded designer in the team.
- Designed and build several embedded based product for NGO by managing resources
- Team of around 20 team members.Follow up this Github Link for More Info [Codes and Document](#).

### CIC, University Of Delhi

Team member & Intern

Atmel, SPI, NRF communication

June 2018 – July 2018 , Delhi, India

- Worked on swarm formation control robots using ROS(robot operating system).
- Designed and build several embedded based swarm board for intercommunication.
- Follow the [link](#) for more Information and Achieved work [Code](#).

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## Research Work

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### \* Poster Presentation

Mar. 2019

- Line Following Algorithms using Finite State Machine at Chandigarh Science Congress (**CHESCON**)

### \* Research Paper

Nov. 2023

- "Autonomous System of Heavy Vehicle Using CAN Networking" [Link](#) at **ICDEMI**, Bangalore through Springer

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## Projects

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### \* Stepper\_STSPIN220–library | C++, Arduino IDE, Driver, STSPIN220

Dec. 2020

- Development of the generic driver for 1/256 steps stepper driver Blog and Code [Link](#).

### \* e-YRC (IIT Bombay) | OpenCV, C++, Rpi, Atmel, i2c, FSM

Oct. 2018 - Feb. 2019

- Making a lighter and less complex multifunctional line Following algorithm using FSM(Finite State Machine).
- Follow the links Youtube [Video](#) and Github [Code](#).

### \* 3D/2D Printer | Marlin, Atmel, Stepper, Embedded C

Jan 2017 - May 2017

- Proposed a 3-D printing technology with the multipurpose capabilities like 2D plotting, 3D printing etc. through addon modules, [Video](#) and Github [Code](#).

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## Achievements And Awards

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- 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.
- 2018 – Winner of Pocket Beagle at **Mouser electronics** event in **IIT Roorkee**
- 2021-2022 – Three times winner of Best Employee per Quarter at **Flux Auto**

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## Community , Events And Volunteer Work

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- Organised Hackathon for straight Three Years [Certificate Page: 1-3](#)
- 2018 & 2019 Speaker at **Software Freedom Day**,Panjab University
- Speaker & Organizer in Embedded Community in the Chandigarh Area, See [Gallery Link](#).
- In 2018 Volunteer at TECHNOCIAN Championship [Certificate Page : 4](#)
- Community Head of Embedded Telegram Group : [Link](#)
- Student Lead of College Eyantra Robotics Lab for 2.5 years
- Regular participant of voluntary Blood Donation Camp

**Note:** All the [Underline](#) text are Clickable Links.