Pranav Kumar

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Education

Virginia Tech — Virginia, USA
MS in Computer Engineering — *August 2024 – Present*

UIET, Panjab University — Chandigarh, IN
B.E in Electronics and Communication Engineering — *7.3/10 CGPA 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

Electronic Devices and Circuits, Digital Electronics, Robotics, Autonomous systems design, 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

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, LaTeX, Shell, Yocto, ESP-IDF

Job / Research Experience

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

- Working Under Supervision of **Asst. Prof. Shishir N. Y. Kolathaya**
- Development of System design of Quadruped 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. — ARMm7, FreeRTOS, EclipseIDE, STM32, TI, BLDC, CAN, I2C, ROS
Embedded System Engineer — *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.)
- Worked on different motor with heavy torque and precision.
- Writting library and driver for different ICs.

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

- Worked on autonomous cooking Machine(for Indian Cusine) 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.

Internship/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.
- For more Infomation see Project **Page** and Beaglebone official blog **Page**.
- Youtube **Playlist** and Github **Code**.

Embedded Product development for Saksham Creative Edu.(NGO) Atmel, I2C, Team Managing
Student Coordinator *Sept.– Dec. 2018, Chandigarh, IN*

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

CIC, University Of Delhi Atmel, SPI, NRF communication
Team member & Intern *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.**

Research Work

*** 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 (DOI no. pending)

Projects

*** 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**.

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.
- 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**

Community , Events And Volunteer Work

- Organised Hackathon for straight Three Years **Certificate Page: 1-3**
- 2018 & 2019 Speaker at **Software Freedom Day**,Panjab University
- Speaker & Organizer in Embbeded 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.