

# Hitesh Kumar

DEEP LEARNING RESEARCHER · COMPUTER VISION

New Delhi, India

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“A healthy mind is an inquisitive mind.”

## Education

### Delhi Technological University (formerly DCE)

B.TECH. IN MECHANICAL ENGINEERING

Delhi, India

2016- 2020

## Skills

<b>Frameworks</b>	OpenCV, Pytorch, JAX, Tensorflow, Matplotlib, Git
<b>Interests</b>	Machine Learning, Deep learning, Computer vision, Robotics
<b>Sensor/Hardware</b>	ELP USB Cameras, IP Cameras, Nvidia Jetson Series, Raspberry Pi, Arduino, 2D Radar, 4D Radar, 2D Lidar, 3D Lidar, Intel Realsense, IR Sensor, Ultrasonic Sensor, Hall effect Sensor etc.
<b>Platform/Tech</b>	Linux, Docker, Google Cloud, ROS, Nvidia, CUDA
<b>Programming</b>	C++, Python, Golang
<b>Languages</b>	English, Korean,Hindi

## Experience

### Euler Motors (EV startup)

New Delhi, India

DEEP LEARNING RESEARCHER - AUTONOMOUS R&D

Aug. 2022 - Present

- Played a pivotal role in **building ADAS** (Advanced driver assistance systems) (L-2 level) software in pure C++ to run efficiently on Nvidia's Jetson Nano. Our team implemented features such as a forward and rear collision warning system and an automatic braking system.
- Led efforts in curating raw data and establishing a semi-automatic data annotation system, speeding up team-wide processes and **saving over two days**.
- Trained and optimized lightweight object detection and segmentation models for low-latency performance on jetson nano embedded hardware, achieving **model size reduction by over 60% and 50%**, respectively.
- Took initiative in writing and maintaining high-quality, production-level documented C++ code (ROS) for the ADAS system. Our collective efforts ensured inference times under 70ms, alert generation at 10Hz, and brought down **hardware costs by 120%**.
- Spearheaded the creation of a model versioning system from scratch, fostering improved model deployment and management practices for the whole team.
- Actively collaborated on building a mono depth estimation model using data sourced from an Intel Realsense-based system.
- Consistently maintained detailed documentation of code and resolved errors, **saving over 10 hours** for my fellow teammates and ensuring smoother project flow.

### SynergyLabs (Deeptech startup)

New Delhi, India

DEEP LEARNING RESEARCHER - R&D

July. 2021 - Aug. 2022

- Trained and tailored classification & object detection models with an appropriate combination of data augmentation to **increase model performance by 14%**.
- Developed Docker APIs to facilitate model deployment on cloud platforms.
- Designed ANPR (Number Plate Detection System) pipeline in golang to achieve **20% better performance**.
- Developed VASD product from scratch deployed on highway locations to detect vehicles less than 6% speed error .
- Constructed pipeline for Oculii 4D radar to parse data for 30% better visualization in bird-eye perspective.
- Worked on attention based OCR model for license plate with 95%+ accuracy on standard number plates.

### SynergyLabs (Deeptech startup)

New Delhi, India

DEEP LEARNING INTERN - R&D

Feb. 2021 - July. 2022

- **Worked closely with the founder** in the development of the “ATCS” product to deploy on 300+ locations.
  - Curated dataset for fine-tuning model like MobilenetV2 & reduced its size to 2MB (by 30%)
  - Communicated and conveyed product functionalities to Clients and improved over feedback within 1 week.
- **Debug issues and maintain documentation** of error resolved to save 3+ hours for fellow teammates.
- Developed UI application using PyQt to configure ATCS product to reduce manual configuring effort by 3x.

## Extracurricular Activity

## Society of Robotics DTU

CORE MEMBER

India

2016 - 2018

- Collaborated with team to build drone using pixhawk and use computer vision human detections from bird eye view.
- Core managing team to organize tech-fest at University level to held competitions like Robosoccer, Robofight etc.
- Gained experience on teaching juniors about fundamentals of computer vision and possible career branches.

## InfernoDTU (Project Mars Rover Prototype)

SOFTWARE HEAD (AUTONOMOUS)

India

2018 - 2020

- Lead autonomous department in the tech team with 5+ members in the development autonomous functionalities of Mars Rover Prototype to compete in competitions.
- Used ROS framework both in C++ and Python to enable rover traversing from a remote location.
- Applied traditional computer vision to detect obstacles and avoid collisions using OpenCV.

## InfernoDTU (Gokart)

MEMBER

India

2017 - 2018

- Built deep learning CNN model using tensorflow to detect animals on driving road.
- Created pedestrian detection algorithm using OpenCV to run in real time on RaspberryPi 4b.
- Worked and Improved on lane detection algorithm for better performance.

## Research Papers

**Analytical and Computational Modelling of Go-Kart Powertrains - Hitesh Kumar, Aditya Natu, Kunal**

2020 **Mathur**, International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)

**Estimation Of Surface Roughness in turning operations using Multivariate Polynomial Regression -**

2020 **Hrishabh Jha, Ashutosh Panpalia, Devanshu Suneja, Geetanshu Ashpilya, Hitesh Kumar, and Vijay Gautam**, Advances in Industrial and Production Engineering

## Honors & Awards

### INTERNATIONAL AWARDS

2018 **Winner in skidpad category**, International Go-Kart Championship (IGC)

2018 **Runner up in autocross category**, International Go-Kart Championship (IGC)

2019 **7th Place out of 32 International Team**, Indian Rover Challenge

India

India

Udupi, Karnataka

## Certificates

2022 **Build a Modern Computer from First Principles: From Nand to Tetris - (ongoing)**, Coursera

2022 **Visual Perception for Self-Driving Cars - (ongoing)**, Coursera

2020 **Robotics: Aerial Robotics**, Coursera

2019 **Introduction To Self Driving Cars**, Coursera

2020 **Data Visualization**, Kaggle

2020 **AWS Machine Learning Foundation Course**, Coursera

2022 **Robotics: Perception**, Coursera

2020 **Introduction to Psychology**, Coursera

2019 **Internet History, Technology, and Security**, Coursera

## Writing

### Personal Blog

WRITER

blog

Jan. 2021 - PRESENT

- Share my perspective to some problems i faced (tech/non-tech) .

## Program Committees

2017 **Organizer**, SRDTU - Tech Fest

2018 **Software Head**, InfernoDTU

India

India