



# Praveen Kumar Rajendran

AI RESEARCH ENGINEER · NEUBILITY · F27S LONG-TERM RESIDENCY VISA HOLDER

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🎓 Scholar

📍 Seoul, S.Korea

## Summary

I'm a Computer Vision/AI Research Engineer at Neubility. I specialize in developing perception algorithms for self-driving robots. I possess a deep understanding of multiview geometry and a passion for training deep neural networks and optimizing them to make them lightweight. My research interests include deep learning, 3D computer vision and autonomous driving. I love cycling. I enjoy videos of 3Blue1Brown and Veritasium.

## Work Experience



**Neubility** · COMPUTER VISION/AI RESEARCH ENGINEER

Seoul, S.Korea

Mar. 2023 - Present

- Spearheaded the development of cutting-edge AI-based object detection/segmentation algorithms/handling class imbalance data.
- Leveraged Diffusion-based AI/GAN methods to diversify training data and enhance model performance.
- Proficiently utilized MLOps tools like WandB and MLflow for streamlined development and deployment.
- Developed systems for deidentifying sensitive data, such as human faces and car license plates.
- Developed systems for autolabelling & active learning from incident data.
- Developed systems for leveraging GPT4 Vision API for understanding unlabelled data.
- continually incorporating state-of-the-art approaches to improve system performance. Familiar with Docker/ONNX/TensorRT for deployment.



**KAIST - Vehicular Intelligence Lab** · GRADUATE STUDENT RESEARCHER

Daejeon, S.Korea

Mar. 2021 - Feb. 2023

- Worked on accident prevention ADAS system using OpenCV, Deep learning, Class activation maps, and Segmentation
- Collaborated on PMD path planning and trajectory prediction in heterogeneous traffic.
- Achieved SoTA on relative camera pose estimation problems with deep learning and published at ECCV-Workshop 2022
- Worked on Domain Adaption. Explored Point Cloud Registration/Analysis for further research.



**SL Lumax & SL Corporation** · SOFTWARE ENGINEER

Chennai, India & Gyeongsan,

S.Korea

Nov. 2018 - Feb. 2021

- Part Leader for the Indian software verification Team of 24 people at SL Corporation.
- Responsible for Software Unit testing (APP+BSP) of Head Lamps LED Driver Module (LDM) , Electronic Control Unit (ECU) , Integrated Lamp Control Unit (ILCU), Door side Object Detection , Camera Monitoring System, Intelligent battery management system and E-shifters.
- Performed more than 250+ software unit/integration testing projects with the team.
- Professional working knowledge on CodeScroll Controller tester for Unit/Integration testing, VBA, VectorCAST and Source code analysis.
- Certified ISTQB CTFL by Korean Software Testing Qualifications Board.

· GRADUATE ENGINEERING TRAINEE - SOFTWARE

Nov. 2017 - Oct. 2018

- Responsible for SiL Unit Test of LED Driver Module (LDM). In-depth BVA for safety critical systems (bitwise/absolute)
- Familiarity with the Embedded C analysis, scripting, Cadence



**Aerobotix** · ROBOTICS AND EMBEDDED SYSTEMS INTERN

Chennai, India

Jan. 2016 - Mar. 2016

- Trained to work with Arduino UNO, Electronics, Sensors, Actuators and Programming microcontrollers.
- Built different robotics applications such as line follower, RC boat, RC hovercraft.
- Hands-on experience on Bluetooth and various modules for navigation.

## Education



**KAIST (World Ranking 20)** · M.S. IN FUTURE VEHICLE PROGRAM

Daejeon, S.Korea

Mar. 2021 - Feb. 2023

- **GPA:** 3.9/4.3  $\approx$  95.55%
- **Subjects:** Artificial intelligence/Machine Learning, Deep Learning, Computer Vision, Autonomous Vehicle Systems, Intelligent Transportation Systems, WL Analysis, Operating Systems, Scientific Writing



**Anna University** · B.E. IN ELECTRICAL AND ELECTRONICS ENGINEERING

Chennai, India

Jun. 2013 - May. 2017

- **GPA:** 8.1/10  $\approx$  81%
- **Subjects:** Engineering Mathematics, Engineering Graphics, Embedded Systems, Control Systems, Object-Oriented Programming, Circuit Theory, Electrical Machines, Power Electronics

• **Projects:** Lidar Obstacle Detection, Camera & Lidar Fusion, Radar Obstacle Detection, Unscented Kalman Filters - [Syllabus](#) - [Certificate](#)

• **Projects:** Data Collection, Model with Google AutoML, Capstone Proposal - [Syllabus](#) - [Certificate](#)

• **Term-1 Projects:** Lane detection, Advanced Lane detection, Traffic sign classifier, Behavioral cloning, EKF  
 • **Term-2 Projects:** Particle filter, Highway driving, PID Controller, System Integration - [Syllabus](#) - [Certificate](#)

• **Fullstack ML:** Predict Customer Churn with Clean Code, Build an ML Pipeline for Short-Term Rental Prices in NYC, Deploying a Machine Learning Model on Heroku with FastAPI, A Dynamic Risk Assessment System - [Syllabus](#)

## Skills

<b>Tech</b>	Computer Vision, Deep Learning, Machine Learning, Robotics, Camera Calibration, Embedded Systems, Software Testing, Multi-view Geometry, 3D Reconstruction, Computational Photography, Visual Localization, GANs
<b>Programming</b>	Python, C, MATLAB, C++
<b>Frameworks &amp; Tools</b>	Git, PyTorch, TensorFlow, NumPy, Scikit-Learn, Codescroll Controller Tester, VectorCAST, Pandas, OpenCV, Keras, Matplotlib, openmm, ROS, Linux, VSCode, Jupyter, Anaconda, Docker, LaTeX
<b>Languages</b>	Tamil(Native), English(Professional), Korean(TOPIK 1)

## Honors & Awards

### INTERNATIONAL

2022&2024	<b>Acceptance</b> , Oxford Machine Learning Summer School, University of Oxford & AI for Global Goals	<i>Oxford, U.K</i>
2019	<b>Receipient</b> , KAIST full funding scholarship for Master's program in Future Vehicle	<i>Daejeon, S.Korea</i>
2019	<b>Receipient</b> , Recipient of Udacity Technology Scholarship powered by Bertelsmann for AI Track - Phase 1	<i>Remote</i>
2019	<b>Award</b> , Korea cycling road grand slam given by K-Water for completion of cycling route of 1837KM	<i>Seoul, S.Korea</i>
2019	<b>Position</b> , Selected for a leadership position of Electronics team of 24 people in SL Corporation.	<i>Gyeongsan, S.Korea</i>

### DOMESTIC

2017	<b>Go Green Award</b> , for making an efficient solar vehicle for Asia's largest solar vehicle competition with Team AATHIRI, ESVC - 2017	<i>Bhimavaram, India</i>
2016	<b>Silver Prize</b> , for the Robotics event of PATHFINDER(Line Follower) in the national level technical symposium VISION organized by Anna University	<i>Chennai, India</i>
2013	<b>School Topper</b> , Higher secondary public examination	<i>Mayiladuthurai, India</i>

## Publications

<b>A Lightweight Domain Adaptive Absolute Pose Regressor Using Barlow Twins Objective</b>	<i>Under review</i>
PRAVEEN KUMAR RAJENDRAN, QUOC-VINH LAI-DANG, LUIZ FELIPE VECCHIETTI, DONGSOO HAR	2023

<b>Reinforcement Learning for Predicting Traffic Accidents</b>	<i>ICAIIIC</i>
INJOON CHO, PRAVEEN KUMAR RAJENDRAN, TAEYOUNG KIM, DONGSOO HAR	2022

<b>RelMobNet: End-to-end relative camera pose estimation using a robust two-stage training</b>	<i>ECCV Workshop</i>
PRAVEEN KUMAR RAJENDRAN, SUMIT MISHRA, LUIZ FELIPE VECCHIETTI, DONGSOO HAR	2022

<b>Sensing accident-prone features in urban scenes for proactive driving and accident prevention</b>	<i>IEEE ITS (IF:9.5)</i>
SUMIT MISHRA, PRAVEEN KUMAR RAJENDRAN, LUIZ FELIPE VECCHIETTI, DONGSOO HAR	2022

## Projects

### Capstone Project: Relative Camera Pose Estimation with Deep Learning

Daejeon, S.Korea

CS570 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Dec. 2021

- Achieved SoTA accuracy in Cambridge landmark dataset in comparison to previous deep learning approaches.

### Capstone Project: ADAS for accident Prevention

Daejeon, S.Korea

PD803 PERCEPTION FOR AUTONOMOUS AND CONNECTED VEHICLES

Dec. 2021

- ADAS that has the potential to improve driver attention to accident cues at accident hotspot locations. Worked with pandas, PyTorch mmsegmentation, class activation maps and matplotlib extensively.

### Capstone Project: End-to-End Autonomous Driving

Daejeon, S.Korea

PD551 FUNDAMENTALS OF VEHICLE ELECTRIC SYSTEMS

Dec. 2021

- End-to-End autonomous driving using imitation learning (Inspired by the famous NVIDIA paper) with the data collected from CARLA

### Course Projects: Projective Geometry & Computational Photogrammetry

Daejeon, S.Korea

PD803 PERCEPTION FOR AUTONOMOUS AND CONNECTED VEHICLES

Dec. 2021

- Camera Calibration, 3D Reconstruction in MATLAB

### Course Projects: CNN Analysis, Regularizations, Sequential modelling

Daejeon, S.Korea

AI502 DEEP LEARNING

Jun. 2021

- Deep Convolution Architecture Analysis with multiple optimizers and regularization techniques. Sequential modelling with LSTMs, Transformers, BERT for extractive Question & Answering.

### Course Projects: Construction of Building Blocks of OS with xv6

Daejeon, S.Korea

EE415 OPERATING SYSTEM

Jun. 2021

- Kernel Threading, Process Scheduler, Nullptr Dereferences and Shared Page Handler, Filesystem Optimization( for small files)

### Electric solar vehicle

Chennai, India

ESVC

Feb. 2017

- Made a Conventional Solar vehicle from scratch at low cost with a team of 25 members for the Asia's largest solar vehicle championship. Secured 21st place out of 150 teams. I was the vice captain of the team. Our team was advised by Dr. Kevin ark kumar from BHEL

### Robotic Arm

Chennai, India

PROJECT AT AEROBOTIX

Mar. 2016

- With the help of flex sensors, various motors and 3D printed objects made a robotic arm which will perform all the actions done by human hand.

## Certifications

Aug. 2022 **Oxford Machine Learning Summer School 2022**, OxML 2022

University of Oxford

Apr. 2022 **Probabilistic Graphical Models - Representation**, Stanford University

Coursera

Mar. 2020 **TensorFlow - Data and Deployment Specialization**, deeplearning.ai

Coursera

Jan. 2020 **Deep Learning Specialization**, deeplearning.ai

Coursera

Dec. 2019 **Bertelsmann Technology Scholarship Phase 1**, AI Track

Udacity

Dec. 2019 **TensorFlow Developer Professional Certificate**, deeplearning.ai

Coursera

Nov. 2019 **Machine Learning**, Stanford University

Coursera

Oct. 2019 **ISTQB CTFL**, Certification

KSTQB

Feb. 2017 **Student Industry Project**, Solar Power Controller

BHEL, Trichy

May. 2015 **Inplant Training**, Power Stability Control

SAIL, Salem

## References

### Prof. Dongsoo Har

Associate Professor

KAIST

Cho Chun Shik Graduate School of Mobility

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### Dr. Luiz Felipe Vecchietti

Senior Researcher

Data Science Group - IBS

Center for Mathematical & Computational Sciences

🏠 Daejeon, S.Korea

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