Praveen Kumar Rajendran

Graduate researcher · computer vision · KAIST

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Daejeon, S.Korea

Summary

I am a Graduate student researcher in Vehicular Intelligence Lab at Korea Advanced Institute of Science and Technology. Currently pursuing M.S. in Future Vehicle Program, advised by *Prof. Dongsoo Har*. My research interests include deep learning, 3D computer vision and autonomous driving. Before joining KAIST, I worked with SL Lumax and SL Corporation as Automotive Software Engineer. I love cycling. I enjoy videos of 3Blue1Brown and Veritasium.

Work Experience

KAIST - Vehicullar 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
- Worked with ROS for the Multi-LiDAR parking robot project.
- 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
- Working on Domain Adaption. Exploring 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 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.
- Preparing test Specification and establishing Traceability between Design requirements and test Specification.
- Interaction with Software Design Engineers, and analyze the issues to fast pace the development and test closure activities.
- Sent to HQ to closely work with developers and test engineers of various countries such as the USA, China, Korea and India.
- 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 Boundary-Value analysis for safety critical systems (bitwise/absolute)
- Software Verification and validation(QA - Static Analysis, Codescroll Controlled Tester - Dynamic Analysis).
- Familiarity with the Embedded C analysis, scripting, Cadence PCB Training

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 ≈ 95.55%
- **Subjects:** Artificial Intelligence/Machine Learning, Deep Learning, Computer Vision, Autonomous Vehicle Systems, Intelligent Transportation Systems, WL Analysis, Operating Systems, Scientific Writing

Udacity · **Self Driving Car Nanodegree**

Remote

July 2021

- **Term-1 Projects:** Lane detection, Advanced Lane detection, Traffic sign classfier, Behavioral cloning, EKF
- **Term-2 Projects:** Particle filter, Highway driving, PID Controller, System Integration
- Project details and curriculum can be found here

Anna University · **B.E. in Electrical and Electronics Engineering** — *Chennai, India* — *Jun. 2013 - May. 2017*

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

Skills

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

Honors & Awards

International

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

Domestic

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

Publications

RelMobNet: End-to-end relative camera pose estimation using a robust two-stage training — *ECCV Workshop*

Praveen Kumar Rajendran, Sumit Mishra, Luiz Felipe Vecchietti, Dongsoo Har — *2022*

Sensing accident-prone features in urban scenes for proactive driving and accident prevention — *IEEE ITS (IF:9.5) - Under Review*

Sumit Mishra, **Praveen Kumar Rajendran**, Luiz Felipe Vecchietti, Dongsoo Har — *2022*

Socially acceptable route planning and trajectory behavior analysis of personal mobility device for mobility management with improved sensing — *RiTA*

Sumit Mishra, **Praveen Kumar Rajendran**, Dongsoo Har — *2021*

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*

- a cost-effective system that has the potential to improve driver attention to accident cues while avoiding slap-dash behaviour 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

PD551 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 Q&A.

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 twenty five members for the Asia's largest solar vehicle championship. Secured 21st place out of 150 teams from all over asia. I was the vice captain of the team. Along with a MPPT Controller project at *BHEL* advised by Dr. *Kevin ark kumar*.

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*
Jul. 2021	**Self-Driving Car Engineer**, Nanodegree Program	*Udacity*
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**, deepleaning.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*

Volunteering

IEEE Sensors Journal, ICRA 2023

Reviewer *PRESENT*

Aerobotix

Workshop Co-ordinator *Jan. 2016 - Oct. 2016*

References

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