Gopi Krishna **Erabati**

Marie Curie PhD Candidate

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"Arise, awake and stop not till the goal is reached." -Swami Vivekananda

Experience

Institute of Systems and Robotics, University of Coimbra — *Coimbra, Portugal*

Researcher — *2019 - Present*

- Designed novel algorithms for *Scene Understanding for Autonomous Driving*
- Achieved not only improved performance but also robustness in adverse weather conditions for small object detection by proposing novel approaches for LiDAR-based and LiDAR-Camera fusion-based 3D object detection
- Achieved real-time inference on NVIDIA Jetson edge GPU for panoptic driving perception and designed LiDAR-based 3D semantic segmentation, which improved the accuracy of faraway objects in sparse LiDAR point cloud

Laboratoire d'Analyse et d'Architecture des Systèmes, LAAS - CNRS — *Toulouse, France*

Research Intern — *Feb. 2018 - July 2018*

- Designed a novel approach for 3D object detection and relative localization using a 3D sensor embedded on a mobile robot
- Integrated the proposed module with ROS

Laboratoire d'Analyse et d'Architecture des Systèmes, LAAS - CNRS — *Toulouse, France*

Research Intern — *June 2017 - Aug. 2017*

- Designed a novel approach for forest fire mapping from low altitude aerial imagery

Defence Research and Development Organization (DRDO) — *Bangalore, India*

Junior Research Fellow — *Nov. 2014 - June 2016*

Education

University of Coimbra — *Coimbra, Portugal*

Doctor of Philosophy (PhD) — *Sept. 2019 - Sept. 2024 (Expected)*

- Thesis: *Learning to Perceive: Scene Understanding for Autonomous Driving*
- Supervisor: Prof. Helder Araujo

Université de Dijon — *Le Creusot, France*

Master of Science in Computer Vision (ERASMUS VIBOT) — *Sept. 2016 - Aug. 2018*

- Thesis: *3D object detection and relative localization using a 3D sensor embedded on a mobile robot*
- Courses: Visual Perception, Machine Learning, Probabilistic Robotics, Autonomous Robotics
- Supervisor: Prof. Frédéric Lerasle, LAAS-CNRS, Toulouse, France
- Grade: 15.0/20.0 (Rank: 2/16)

Kakatiya University — *Warangal, India*

Bachelor Of Technology in Electronics And Instrumentation Engineering — *Oct. 2009 - June 2013*

- Thesis: *Development of quadcopter for search and rescue in natural disasters*
- Grade: 89.8 % (Rank: 1/66)
- Received Gold Medal for excellence in academics

Publications

RetFormer: Embracing Point Cloud Transformer with Retentive Network

G. K. Erabati, H. Araujo

IEEE Transactions on Intelligent Vehicles (IEEE T-IV), 2024

SRFDet3D: Sparse Region Fusion based 3D Object Detection

G. K. Erabati, H. Araujo

Neurocomputing 593, 2024

Li3DeTr: A LiDAR Based 3D Detection Transformer

G. K. Erabati, H. Araujo

IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2023

MSF3DDETR: Multi-Sensor Fusion 3D Detection Transformer for Autonomous Driving

G. K. Erabati, H. Araujo

ICPR 2022 workshop on Deep Learning for Visual Detection and Recognition (DLVDR), 2022

DeLiVoTr: Deep and light-weight voxel transformer for 3D object detection

G. K. Erabati, H. Araujo

Intelligent Systems with Applications 22, 2024

DAFDeTr: Deformable Attention Fusion Based 3D Detection Transformer

G. K. Erabati, H. Araujo

Robotics, Computer Vision and Intelligent Systems (ROBOVIS), 2024

SL3D - Single Look 3D Object Detection based on RGB-D Images

G. K. Erabati, H. Araujo

2020 Digital Image Computing: Techniques and Applications (DICTA), 2020

MOSNet: A lightweight Moving Object Segmentation Network for Autonomous Driving

G. K. Erabati, H. Araujo

RECPAD 2021 - 27th Portuguese Conference on Pattern Recognition, 2021

Dynamic Obstacle Detection in Traffic Environments

G. K. Erabati, H. Araujo

13th International Conference on Distributed Smart Cameras, 2019

Object Detection in Traffic Scenarios - A Comparison of Traditional and Deep Learning Approaches

G. K. Erabati, N. Gonçalves, H. Araujo

9th International Conference on Advanced Information Technologies and Applications (ICAITA 2020), 2020

Under Review

RetSeg3D: Retention-based 3D Semantic Segmentation

G. K. Erabati, H. Araujo

Computer Vision and Image Understanding (in 2nd round of review)

DDet3D: Embracing 3D Object Detector with Diffusion

G. K. Erabati, H. Araujo

Applied Intelligence (in 2nd round of review)

SCAM-P: Spatial Channel Attention Module for Panoptic Driving Perception

G. K. Erabati, H. Araujo

Under Review

Projects and Training

Training

- Attended **Oxford Machine Learning Summer School** (OxML 2023) at University of Oxford, UK
- Deep Learning Specialization taught by Prof. Andrew Ng on Coursera
- Attended AI-DLDA 2020 International Summer School on Artificial Intelligence at Università di Udine, Italy
- Presented at WACV 2023, ICPRW 2022, ROBOVIS 2024, RECPAD 2021, DICTA 2020, ICDSC 2019

Projects

- Human Activity Recognition in Videos
- Mapping, Autonomous Navigation and Localization of Turtlebot using ROS
- Development of Computer Vision Toolbox in C++ and MATLAB using OpenCV
- Development of 3D Scanner using Kinect and PCL
- Development of Face Recognition software using PCA

Skills

	Machine Learning, Computer Vision, Deep Learning
Libraries	PyTorch, Keras, TensorFlow, OpenCV, PCL, NumPy, Scikit-learn, ONNX, TensorRT
Programming	Python, C++, VHDL, LaTeX
Others	MATLAB, LabVIEW, Cadence Virtuoso, AvrStudio, Multisim, MWS CST
Languages	English, Telugu, Hindi, Portuguese (Elementary)

Honors & Awards

2021	**FCT PhD Scholarship Grant,** Fundação para a Ciência e a Tecnologia	*Portugal*
2019	**Marie Skłodowska-Curie Fellowship Grant,** European Commission	*Portugal*
2014	**Junior Research Fellowship Grant,** Defence Research and Development Organization	*India*
2013	**Gold Medalist,** Kakatiya University	*India*
2013	**Featured in the Roll of Honor Board,** Kakatiya Institute of Technology and Science	*India*