

# 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

## Skills

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

## Education

### University of Coimbra

Coimbra, Portugal

DOCTOR OF PHILOSOPHY (PHD)

Sept. 2019 - Dec. 2024 (Expected)

- Part of EU H2020 Marie Skłodowska-Curie Actions Innovative Training Network ACHIEVE
- 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

## Projects and Training

### PROJECTS (Click here for more details)

- 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

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

Publications

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**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

**RetSeg3D: Retention-based 3D Semantic Segmentation for Autonomous Driving**

G. K. Erabati, H. Araujo

*Computer Vision and Image Understanding (CVIU)*, 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

**DDet3D: Embracing 3D Object Detector with Diffusion**

G. K. Erabati, H. Araujo

*Applied Intelligence*, 2024

**DAFDeTr: Deformable Attention Fusion Based 3D Detection Transformer**

G. K. Erabati, H. Araujo

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

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

G. K. Erabati, H. Araujo

*Under Review*

**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

Honors & Awards

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