Vamshi **Kodipaka**

FCT PORTUGAL · PHD CANDIDATE

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"Be the change that you want to see in the world." - Mahatma Gandhi

Summary

PhD Researcher in Electrical Engineering and Intelligent Systems with research in aerial person detection and drone-based search and rescue. Expertise in deep learning, computer vision, AI, UAV navigation, and informative path planning. Experienced in three national projects and academic publishing. An adaptive team player, a quick learner with enthusiasm to explore new ideas. My motto is to add value to everything I do.

Work Experience

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

RESEARCHER
Sep. 2022 - Present

- Goal is to develop and integrate the novel informative planning and detection system for drone-based missing person searches in the wilderness.
- Proposed hybrid YOLO-Transformers and Retention, achieved the robustness over 30% for tiny and small aerial person detection.
- Working on UAV informative path planning approaches for effective search, deployment on ROS + NVIDIA Jetson with field experiments.

University of Coimbra
Coimbra, Portugal

RESEARCH FELLOW
Mar. 2022 - Jun. 2022

- Goal was to develop artificial perception mechanisms supporting forestry ground robotic operations for land maintenance and clearance.
- Extended work to 2D Dynamic Entity Tracking with Multispectral Images to dockers, dataset labelling, and Stereo-3D-Reconstruction in ROS.
- Project: Safety, Exploration and Maintenance of Forests with the Integration of Ecological Robotics (SemFire)
- Supervisors: Prof. David Portugal (ISR-UC), Prof. João Filipe Ferreira (ISR-UC/NTU, UK)

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

RESEARCH INTERN
Feb. 2020 - Jul. 2020

- Goal was to integrate a vision-based system on a quadrotor and a rover, and develop algorithms to track another moving quadrotor outdoors.
- Designed a novel approach for Occlusion Avoidance by Mathematical Modelling, surveyed literature for learning approaches in tracking, and benchmarked Convolutional Neural Networks with PC configurations, CPU and GPUs.
- Project: Control of Multi-Robot Systems for Observing Dynamical Phenomena (MuRoPhen)

Education

University of Coimbra
Coimbra, Portugal

DOCTOR OF PHILOSOPHY (PHD) IN ELECTRICAL ENGINEERING AND INTELLIGENT SYSTEMS
Sep. 2022 - Present

- Thesis: Navigation Systems for Search and Rescue Operations with Drones
- Supervisors: Prof. Lino Marques, Prof. Rui Cortesao, Prof. Helder Araujo
- Courses: Machine Learning for Intelligent Systems, Methodologies of Mobile Robotics
- Dataset releases: ISR Fluvial Forest Drone Data 2023

Université de Bourgogne
Le Creusot, France

MASTER OF SCIENCE IN COMPUTER VISION AND ROBOTICS (VIBOT)
Sep. 2018 - Sep. 2020

- Thesis: Vision-based Multi-robot Target Tracking with Aerial and Ground Robots
- Supervisors: Prof. Antonio Franchi (University of Twente, Netherlands) and Prof. Daniel Sidobre (LAAS-CNRS, France)
- Courses: Visual Perception, Machine Learning, Probabilistic Robotics, Autonomous Robotics, Software Engineering, Applied Mathematics
- Grade: 14.0/20.0

Kakatiya University
Warangal, India

BACHELOR OF TECHNOLOGY IN ELECTRONICS AND INSTRUMENTATION ENGINEERING
Sep. 2012 - Sep. 2016

- Thesis: Performance evaluation of Various QRS Detection Algorithms
- Supervisors: Prof. Shashikanth Boorla (KITSW) and Prof. Venu Madhav Kottur (KITSW)
- Courses: Image Processing, Signals, Computer Architecture, Electronic Devices, Measurements, Sensors, Process Control, Analog/Digital IC, Control Systems, Mechatronics, Mathematics, Physics
- Grade: 77.6 %

Publications

AUTHORS: V KODIPAKA, LF MARQUES, RPD CORTESÃO, HJ ARAÚJO (Vamshi first authored all)
RAS, 2025 (In Review) TPH-YOLOv7t: A Boosted YOLO Transformer Prediction Head for Search and Rescue with Drones
ROBOT: 6th Iberian Robotics Conference, 2023 APH-YOLOv7t: A YOLO Attention Prediction Head for Search and Rescue with Drones

2026 (to Submit) Synaptra: Composable Synaptic-Routed Attention for Aerial Person Detection
2026 (to Submit) AeroSense: Embracing Synaptic Attention for Aerial Person Detection
2026 (to Submit) Ingenious: Sparse-Routed Synaptic Attention via Low-Rank Linear Projections for Aerial Person Detection
2026 (to Submit) The Drone's Dreamscape: A Review of AI's Capacity for Intuitive Human Detection in Unstructured Wilderness Environments
2026 (to Submit) DroneSplat-R: Retention-based 3D Gaussian Splatting from In-the-Wild Drone Imagery
2026 (to Submit) Retention-YOLO: An Ultraboost YOLO Retention Prediction Head for Search and Rescue with Drones

2026 (In Preparation) NeuroSpatialRouter: A Biologically-Plausible Architecture for Unified Visual Sequence Modeling
2026 (In Preparation) Synaptic Attention-Guided Drone Autonomy for Missing Persons Search in the Wild
2026 (In Preparation) 11ARC-ASS: Benchmarking OpenMMlab's 11 Neural Networks for Aerial Semantic Segmentation on RescueNet data

Projects & Training

Projects

- ROS Project: Autonomous Navigation and Tag Detection for IoT Applications
- Development of IPCV Toolbox for Camera Simulating System
- Tracking Multiple Objects in Surveillance Cameras and Videos
- Extension for Harris Operator for Interest Point Detection on 3D Meshes in C++
- Performance evaluation of Various Image Denoising Algorithms
- Visual Inspection in Soft Drink Bottle Plant; Face Recognition System using PCA
- Music Genre Classification; Visual Servoing from Lines, Points, and Image

Training

- Participated in Ocean Lander Challenge at sponsored **MIT Portugal's Marine Robotics Summer School**, in Azores Islands (2024)
- Deep Learning Specialization, Aerial Robotics and Basics of Reinforcement Learning – Coursera (2020)
- Participated in LAAS-MBZIRC Seminar – International Robotic Challenge and Experiences, Abu Dhabi (2020)
- MOOCs: Elements of AI - University of Helsinki (2018), and Geospatial Applications for Disaster Risk Management - ISRO/UNOOSA (2021)
- International Astronomical Asteroid Search Collaboration, Space App Challenge Paris – NASA (2019/21)
- Industrial Visits: NTPC-Ramagundam, Indian Railways-Kazipet, and ATI-EPI Hyderabad (2012-16)

Volunteering

- Reviewer for 11th European Conference on Mobile Robots (2023) and 7th Iberian Robotics Conference (2024)
- As a member of KITS Warangal IEEE Student Branch, participated in numerous events of Warangal section (2014-16)
- Participant: WHO - COVID'19, Shiksha Shilpi's Aahar Kranti, Creating in Public Space FAI-AR, RRITTOD (Rehabilitation)
- Donated 1600 euros: UNICEF-Portugal, UNFPA, UN-WFP, ISKCON, Isha Foundation, No Baby Blisters; Blood Donation
- As an Altruist and Care-giver: donated 19,500 euros to two kids for their education

Skills

Software	Python, C, C++, Java, MATLAB, Git
Libraries	PyTorch, Tensorflow, ROS, Gazebo, OpenCV, Cuda
Others	Linux, Oracle, LaTeX, NVIDIA Jetson Orin Nano
Languages	English, Hindi, Telugu, Portuguese (Elementary)

Honors & Awards

2022	**Scholarship**, from FCT-Portugal for four year PhD research (57,000 euros till date)	*Portugal*
2022	**Scholarship**, from FCT - University of Coimbra for four months (4,300 euros)	*Portugal*
2020	**Stipend**, LAAS-CNRS Intern gratification for six months (3,600 euros)	*India*
2018	**Scholarship**, TS OBC Mahatma Jyothiba Phule Overseas Vidhyanidhi for Full M.Sc. studies (20,640 euros)	*India*
2016	**1st Place**, Best Project Award of the Year – EIE, KITSW	*Warangal, India*
2012	**45% Fee Reimbursement**, for four-year B.Tech studies	*Warangal, India*
2010	**Fully Funded**, Free Seat for two years of College	*Warangal, India*