Sushil SHARMA, PhD

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SUMMARY

PhD in Robotics with a research focus on **autonomous driving**, completed in collaboration with **Valeo Vision Systems, Ireland**. Over **6 years of experience** in trajectory prediction, sensor fusion, and Bird's-Eye View (BEV) perception, combining deep learning and computer vision to enhance vehicle intelligence and automation. Proven ability to bridge **research and real-world deployment** through collaboration with cross-functional teams in both academia and industry. Passionate about developing **scalable, production-ready AI solutions** that advance the performance and safety of **autonomous vehicle systems**.

EDUCATION

University of Limerick – Limerick, Ireland — September 2021 – August 2025
PhD in Electronic & Computer Engineering

- Bird's-Eye-View Based Multi-Agent Trajectory Prediction for Autonomous Driving with Segmentation and Sensor Fusion.

Université Paris Saclay & Poznan University of Technology – Paris, France / Poznan, Poland — March 2016 – September 2017
MSc in Automation & Robotics Specialization in Autonomous Systems (GPA: 4.75/5.0)

- Master's thesis: Deployment of drone demonstrations automatic take-off and landing of a drone on a mobile robot.

Institute of Technology & Management (ITM) – Gwalior, India — July 2014 – August 2019
BEng in Electronics & Instrumentation (GPA: 9.0/10.0)

- Undergraduate Thesis: Gesture-Based Robotic Arm for Disabled People Using Flex Sensors.

SKILLS AND TOOLS

- Machine Learning, Robotics & AI: PyTorch, TensorFlow, ROS, OpenCV
- Programming: Python, C++, R, MATLAB, NodeJS
- Tools & Frameworks: MM Detection, Docker, Git, Papyrus, Latex, Carla, Carsim, Gazebo

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PROFESSIONAL EXPERIENCE

D²ICE Research Centre – Limerick, Ireland — September 2021 – Present
Deep Learning/ Computer Vision Engineer

- Conducted research on automated parking systems, leveraging multi-camera perception, segmentation, and sensor fusion to build accurate Bird's-Eye View (BEV) representations.
- Developed novel trajectory prediction models using Transformers, Graph Neural Networks (GNNs), and interaction-aware architectures, significantly improving vehicle detection and navigation in complex parking environments.
- Collaborated with the **Principal AI Architect** and AI Software Architect at **Valeo** to design and optimize end-to-end perception and prediction pipelines for automated parking.
- *Advancement:* Achieved state-of-the-art performance in trajectory prediction by combining BEV representations with deep learning architectures, advancing the reliability of automated parking systems.

Valeo.ai – Paris, France — September 2024 – December 2024
Deep Learning/ Computer Vision Engineer

- Integrate the online mapping with uncertainty into end-to-end trained methods.
- Extend this idea of uncertainty for detections and tracks, to consider more explicitly their errors.
- Go for End-to-end forecasting with BEV heatmaps (uncertainty, no assignments, etc.).

Valeo Vision Systems – Tuam, Galway, Ireland — June 2022 – November 2022
Deep learning/ Computer Vision Engineer

- Develop a neural network-based model to predict trajectory based on the input of the top-view image.
- Develop a simulation framework for the project, based on open-source CARLA simulation.
- Prediction of vehicle's short-term trajectory from only orthographic images with no explicit knowledge encoding.
- To Generate a dataset to encourage the research community to pursue the direction of end-to-end implicit trajectory prediction learning method.

IBISC-CNRS – Paris, France November 2018 – August 2021

R&D Engineer

- Image Processing Algorithm's: Object, Vehicle, Pedestrian Detection & Road Detection.
- Understand sensors used for robotics and be able to specify sensor requirements, test and evaluate them.
- Improve algorithmic and computational performance by working with real and synthetic data.
- Software integration of robotics components: sensors, actuators etc.
- Design testing procedures and coordinate to identify problems and solutions.

Essel Propack Polska Europe – Poland October 2017 – October 2018

Process Technician Engineer

- Performed CNC machine error analysis to improve operational efficiency and reduce downtime.
- Developed an automated defect detection model using a machine vision approach (with Omron ZFV sensor) to identify issues such as popping shoulders, blocked orifices, and wrinkled tubes in real time, achieving 93% accuracy and demonstrating strong potential for industrial deployment.
- Designed a conceptual Automatic Packing System using SolidWorks, applying industrial automation and robotics knowledge.
- Collaborated effectively with cross-functional teams in a fast-paced production environment.

ACADEMIC EXPERIENCE

University of Limerick – Limerick, Ireland September 2021 –August2025

Teaching Assistant (postgraduate-level modules)

- Modules: Machine Vision and Image Processing; and Deep Learning for Computer Vision

Université Paris Saclay – Paris, France March 2017 –September 2017

Researcher – IBISC Lab

- Implementation of autonomous navigation strategies in an indoor environment (e.g. SLAM).
- Develop image processing algorithm to control UAV to do smooth landing on a UGV.
- Develop algorithms for pattern recognition using OpenCV and establish communication between UAV and UGV stations via Connex Prosight.

AWARDS AND RECOGNITIONS

- Vice Chair Student Branch Chapter at UL (IEEE ITSS).
- Irish Machine Vision and Image Processing Conference, Committee Members & Reviewer for IMVIP 2023.
- ERASMUS + European Scholarship from September 2016 to September 2017.
- Reviewer for leading journals and conferences, including **IEEE Access**, **IEEE ICVES**, and **Springer Nature** (Intelligent Transportation Society).