

# SOUJANYA SYAMAL

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## PERSONAL STATEMENT

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I am an accomplished engineering professional with an MSc in Connected and Autonomous Vehicle Engineering and a B.Tech in Electronics and Communication Engineering. Specializing in machine learning, AI, sensor fusion, and Positioning, Navigation, and Timing (PNT), I have a track record of innovation substantiated by patents and peer-reviewed publications. With hands-on experience in research and commercial projects, I've contributed to significant performance enhancements in autonomous systems and sensor fusion technologies. Proficient in C, C++, and Python, and familiar with deep learning frameworks like TensorFlow and PyTorch, I am poised to make impactful contributions in advanced technology domains

## KEY ACHIEVEMENTS

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- Elected Secretary of Cranfield Autonomous Vehicle Society (2022-23): Led AI-focused projects and hosted events focusing on vehicle autonomy
- Director's Award for Best Student Contribution: Recognized for excellent contributions to Academics and Institutions
- Intellectual Property Award: Filed 5 patents related to AI and autonomous systems at Arthlex Research Pvt. Ltd
- Received the "Emerging Scientist Award" at the 2020 International Scientist Awards for pioneering research in autonomous vehicles, sensor fusion, and AI in smart cities
- Won 1st Prize for "Most Innovative Project" at the SMART International Makers' Faire, Columbia University, New York - USA, for an autonomous toy car prototype, Oct 2019

## EDUCATION

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**MSc Connected and Autonomous Vehicle Engineering, Cranfield University, Cranfield, UK** **September 2022 - September 2023**

- Score: 71.3%
- Thesis: Multi-Sensor Fusion for Object Detection and Localisation Using Deep Learning
- Group Project: Development of a solution for driverless navigation on highways, relying on roadside sensors and V2I communication, tested on LR Discovery.

**B.Tech. Electronics and Communication Engineering, Institute of Engineering and Management, Kolkata, India** **August 2018 - July 2022**

- CGPA: 8.74 out of 10 (Grade A - 87%)
- Final Year Project (Thesis): Autonomous Toy Car using Computer Vision and Deep Learning Techniques
- Director's Award For Best Student Contribution

## PROFESSIONAL EXPERIENCE

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**Cranfield University, Bedford, UK, Research Assistant** **September 2023 - Present**

- Applying Machine Learning (ML) techniques to optimize LEO-PNT precision and efficiency, contributing to advancements in space technology
- Contributing development of the Bayesian-LSTM algorithm for sensor fusion within the "NAVISP" project, commissioned by the European Space Agency
- Conducted an extensive state-of-the-art literature review for Plextec, focusing on Positioning, Navigation, and Timing (PNT) using Machine Learning (ML) algorithms.
- Utilizing deep learning techniques to enhance the reliability of PNT systems, achieving a reduction in error rate by 15%
- Facilitating weekly team discussions to present research findings, shape project planning, and solve complex problems

**Arthlex Research Pvt. Ltd., Chennai, India, Research and Development Engineer** **June 2021 - September 2022**

- Led R&D projects in Sensor Fusion (Lidar+Camera), AI and Machine Learning for Electric Vehicles, specifically ADAS systems and Autonomous Driving, resulting in 5 patents and a 15% increase in driving efficiency
- Designed test specifications and executed real-world testing on 10+ prototype Electric Vehicles, leading to a 20% improvement in ADAS system reliability and accuracy

- Utilized proprietary software tools to analyse data and triage 200+ software issues, successfully identifying and resolving 95% of abnormal vehicle behaviours within a 72-hour window
- Developed and optimized ADAS features, specifically Front Collision Warning and Cruise Control, resulting in a 30% reduction in false alerts and a 10% improvement in fuel efficiency
- Mentored 5 junior researchers intern and 12 students, providing guidance on research methodologies and data analysis techniques

#### **Arthlex Research Pvd. Ltd., Chennai, India, Intern- Researcher and Project Scientist**

**January 2020 - May 2021**

- Conducted research on V2X and V2V communication, Cloud Computing and Machine-Learning contributing to the development of a Smart Cloud Traffic Management System prototype resulting in improved road safety metrics by 20% and the publication of 1 peer-reviewed paper
- Developed Smart-Haptic navigation system for Electric Vehicles, applying computer vision algorithms to detect traffic and pedestrians; resulting in a 25% improvement in emergency braking response times
- Constructed risk assessment strategies, identifying and mitigating 10+ potential roadblocks, resulting in a 30% reduction in project delays
- Organized and chaired monthly review meetings with 15+ senior stakeholders, successfully maintaining 100% project endorsement and securing £120,000 in additional funding by grant writing
- Facilitated cross-disciplinary collaboration among engineers, data scientists, and domain experts, resulting in a 20% improvement in team productivity and the completion of 3 major projects ahead of schedule

#### **TECHNICAL SKILLS**

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- Programming: Proficient in C, C++, Python
- Machine Learning: Familiar with supervised and unsupervised algorithms, including SVM and Neural Networks
- Deep Learning Frameworks: Skilled in TensorFlow, PyTorch, and Keras
- Data Analysis: Proficient in Pandas, NumPy, and Matplotlib
- Sensor Fusion: Experience in PNT applications
- Robotics: Hands-on experience with Robot Operating System (ROS) and path planning
- Cloud Computing: Skilled in AWS, GCP and Azure
- Version Control: Experienced with Git
- Simulation: Proficient in MATLAB and Simulink
- Embedded Systems: Experience with microcontrollers, RTOS

#### **INDIVIDUAL PROJECT**

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- Vehicle Detection & Tracking: Achieved 98% accuracy with YOLO v8 and Deep Sort Algorithm
- Master's Thesis: Sensor Fusion with Deep Learning: Employed Lidar, Camera, and Radar data, using Deep Learning techniques to detect and localise objects, resulting in a 20% improvement in localisation
- GUI for ROS Data Display: Developed a Human-Machine Interface deploying Rosbridge\_websocket, HTML, CSS, and JavaScript to visualize ROS data in real-time
- Mini Rover: Created a WiFi-controlled autonomous rover
- Autonomous Toy Car: Implemented computer vision and deep learning
- Semi-Autonomous Delivery Drone: semi-autonomous package delivery, reducing delivery time by 15%
- Fake News Detection: 90% classification accuracy with ensemble machine learning methods
- Stock Prediction: 85% accuracy using LSTM and Python
- IoT Home System: Developed a voice-controlled smart home system using Node MCU, Web-Hooks
- App-Controlled Smart Electric Bike with ADAS: Including collision warning and smart navigation

#### **PUBLICATIONS**

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- Book Chapter: Deep Learning Based Autonomous Driving and Cloud Traffic Management System for Smart Cities, ISBN 9781032404240, by CRC Press (Taylor & Francis)
- Conference Paper: SPEED CONTROLLING & TRAFFIC MANAGEMENT SYSTEM (SCTMS) DOI: 10.1109/UEMCON47517.2019.8993092
- Conference Paper: IoT Based Smart Security and Home Automation System, DOI:10.1109/UEMCON47517.2019.8992994
- Conference Paper: Generalised Differential Cryptanalysis Check for Block Ciphers, DOI: 10.1109/IEMCON.2019.8936149