# Rohan Thorat

Machine Learning Engineer

Sheffield | rohanthorat28@gmail.com | Portfolio | LinkedIn | Github

## Professional Summary

Machine Learning engineer with a **Distinction in MSc Artificial Intelligence** from Queen Mary University London, specializing in **Deep Learning and Computer Vision**. Proficient in **Python, PyTorch and OpenCV**, with experience in **real-time AI applications**. As a **Research Assistant**, developed **AI-driven player tracking models**, demonstrating expertise in **spatial data analysis, feature extraction, and data-driven decision-making**.

## Skills

**Languages:** Python, MATLAB

**Frameworks:** PyTorch, Scikit-learn, OpenCV, NumPy, Pandas, Matplotlib, Seaborn

**Technologies:** Computer Vision, Deep Learning, Time-Series Analysis, Linux, Git

**Soft Skills:** Teamwork, problem-solving, adaptability, and effective communication

## Work Experience

**Machine Learning Research Assistant** | **University of Sheffield** – UK Jun 2024 – Present

- Developed an AI pipeline for player tracking and ball trajectory prediction, integrating **YOLO-based object detection** and **LSTM-based trajectory forecasting**.
- Manually reviewed and curated over **50 tennis match videos**, extracting high-quality clips with sufficient shots for dataset inclusion, ensuring robust model training using **Python, OpenCV, and ROS**.
- Converted pixel-based coordinates into real-world spatial metrics through **homography calibration**, improving tracking precision by **35%** for accurate player movement analysis.
- Developed a **hybrid LSTM and Random Forest model** for ball landing prediction, increasing accuracy by **20%** and improving adaptability to different play styles. Deployed as an optimized inference service for shot pattern analysis.
- Designed and implemented **ROS-based communication** between AI models and Arduino-controlled hardware, enabling **automated AI-driven ball machine movements**.

## Additional Work Experience

**System Engineer** | **Tata Consultancy Services Ltd.** – India Aug 2018 – Aug 2022

- **Automated system monitoring**, identifying and remediating over **500 security vulnerabilities**, ensuring **99.9% uptime** while maintaining an **SLA compliance of 95%**.
- **Developed process automation scripts**, reducing **manual workload by 50%** and improving system efficiency.
- **Led and mentored a team of 7 professionals**, increasing project delivery speed by **20%** through collaboration and effective problem-solving.
- **Collaborated with cross-functional teams** to optimize system performance, reducing **server response time by 35%** and improving data processing for enterprise applications.
- **Applied data-driven decision-making techniques**, utilizing log analysis and pattern recognition to optimize system performance, demonstrating transferable skills relevant to **ML model optimization**.

## Education

**MSc in Artificial Intelligence (Distinction) | Queen Mary University London** Sep 2022 – Sep 2023

**Relevant Coursework:** Computer Vision, Machine Learning, Artificial Intelligence, Applied Statistics, Deep Learning, Ethics in AI.

**Dissertation: Transfer Learning for Car Parking Detection using Single Shot Multibox Detector**

- Developed an AI-driven car parking detection system using the SSD object detection algorithm, achieving a **20% improvement in accuracy** through k-means clustering.
- Optimized SSD model to reduce computational costs, enhancing efficiency for real-world deployment.
- Focused on **energy-efficient AI training**, minimizing parameter usage and power consumption.
- ***Tools/Skills:*** Python, Deep Learning, Computer Vision, Transfer Learning, Model Optimization, Research Writing.

**Bachelor of Electronics Engineering | RAIT - Mumbai University** Aug 2014 – Jul 2018

**Relevant Coursework:** Object-Oriented Programming, Structured Programming Approach, Digital Image Processing, Applied Mathematics.

**Dissertation: Automatic Car Driving System Using Fuzzy Logic**

- Designed an autonomous driving system inspired by Tesla, implementing **fuzzy logic for intelligent decision-making** using Python.
- Integrated multiple **sensor-based inputs** to create a functional prototype for autonomous navigation.
- Applied **hardware-software integration** to build a real-world simulation of AI-driven control systems
- ***Tools/Skills:*** Python, Deep Learning, Computer Vision, Transfer Learning, Model Optimization, Research Writing.

## Projects

**PII Classification for Blogging Platform** May 2024 – Jun 2024

- Engineered a **privacy-preserving text classification model** to detect and redact PII, achieving **93.98% accuracy** and an **F1 score of 79.21%**.
- Enhanced **data preprocessing and augmentation** techniques, improving recall for *Credit Card Number* detection by over **10%** and boosting F1 scores for minority classes by **20%**.
- Optimized a **Transformer-based NLP model**, reducing training time by **30%** and achieving a processing speed of **24 samples per second** with efficient **GPU utilization**.

**Unsupervised Learning with Generative Adversarial Networks (GANs)** Apr 2023 – May 2023

- Conducted a comparative study between **Autoencoders and GANs** to address challenges in **unsupervised learning**.
- Developed and optimized both models, with the **GAN achieving a 15% improvement in image quality** over the Autoencoder, showcasing deep learning expertise.
- Analyzed model training convergence and generated high-quality synthetic data for exploratory research.