Rahul Yadav

Master's Student in AI Engineering of Autonomous Systems

ray9202@thi.de +49 15510310925 Ingolstadt, Germany

linkedin.com/in/rahul-yadav-14a4ab1b1 https://rahuly06.github.io/github-portfolio/

Profile

Master's student in AI Engineering of Autonomous Systems with expertise in machine learning, computer vision, data-driven modeling, and simulation. Experienced in applying AI to real-world use cases such as vehicle dynamics and physics-informed ML, with publications in IEEE and international journals. Skilled at bridging research and practice by effectively communicating complex concepts within teams. Currently seeking a thesis opportunity in computer vision, machine learning, or related fields, with the goal of contributing to innovative projects, supporting implementation, and advancing AI maturity through research, training, and collaboration.

Professional Experience

Working Student- SimulationX, *Keysight Inc*
09/2024 – present | Dresden, Germany

- Developed and enhanced vehicle dynamics models with component-level fidelity.
- Improved energy consumption simulations by modeling tire power loss and suspension behavior.
- Contributed to OpenCRG integration for realistic road surface modeling.
- Currently developing a driver model to follow user-defined trajectories.

Junior Engineer, *Toyo Engineering India*
08/2021 – 04/2024 | Mumbai, India

- Designed 3D piping layouts and performed isometric analysis using Aveva E3D for IOCL and Nayara Energy projects.

Software Skills

GIT and GitHub ●●●●○

Python Programming ●●●●○
Including Numpy, Pandas, Matplotlib and Scikit-learn libraries

Pytorch ●●●○○

TensorFlow ●○○○○

FastAPI ●●○○○

Docker ●●○○○

C/C++ Programming ●●○○○

MATLAB ●●●○○

Simulink ●●●●○

Education

Master of Engineering, *Technische Hochschule Ingolstadt*
03/2024 – present | Ingolstadt, Germany
Artificial Intelligence Engineering of Autonomous Systems

Bachelors of Technology,
K J Somaiya College of Engineering (Mumbai University)
08/2017 – 07/2021 | Mumbai, India
Mechanical Engineering, Grade- 1.6

Projects

Traffic Sign Recognition (CNN + YOLOv8, GTSRB Dataset)
08/2025

- Achieved 99%+ accuracy on GTSRB dataset using a custom CNN in PyTorch.
- Combined YOLOv8 detection with CNN classification for modular real-time recognition.
- Deployed as a Dockerized FastAPI service with live video stream inference.

African Forest Animal Classifier
07/2025 – 07/2025

- Implemented a complete ML pipeline (data prep → training → deployment).
- Achieved 94% accuracy using transfer learning; deployed real-time inference with FastAPI.

Robust Vehicle State Estimation for Autonomous Driving with Physics Informed Machine Learning
03/2025 – 06/2025

- Developed a vehicle state estimation framework using OBD and ADMA sensor data, sampled at different frequencies..
- Preprocessed and aligned asynchronous sensor data to improve model input consistency and training.
- Implemented and compared RNN, LSTM, and Transformer-based architectures for time-series modeling of vehicle states such as velocity, acceleration, and yaw rate.
- Integrated physics-based constraints into ML models to guide learning and improve generalization across diverse driving scenarios.

Q Learning and DQN
05/2024 – 07/2024

- Developed a custom environment using OpenAI-Gymnasium, the environment has an agent trying to reach goal by evading different hell states.
- Used Q-learning and DQN Reinforcement learning methods to train the agent to follow most suited optimal path.

Publications

International Journal for Research in Applied Science and Engineering Technology
2022

- Partial Differential Equations (PDE) toolbox from MATLAB was used to perform Finite Element Analysis (FEA) and the results were compared with more common FE software.

IEEE International Transportation Electrification Conference - India
2021

- Presented paper at conference which discussed methods to implement Launch Control (LC) in an Formula Student Electric Vehicle.

Earlier Project

Suspension & Vehicle Dynamics Lead,
Orion Racing India, Formula Student
11/2018 – 07/2021 | Mumbai, India

- Designed a Z-type anti-roll bar, improving system adjustability by 22%.
- Developed Yaw Moment Diagrams and MATLAB models for traction & launch control.
- Conducted tire data analysis (TTC) to optimize vehicle performance.

Languages

English ●●●●●
German ●●○○○
Hindi ●●●●●

Relevant Coursework

- Applied Mathematics
- Engineering Mechanics
- Principles of Autonomy and Decision Making
- Machine Perception and Cognition
- Automation and Control
- Material Science
- Artificial Intelligence and Automotive Systems
- Sensor Data and Information Fusion
- System Identification, Modeling and Simulation
- Computing and Connectivity Technologies
- Systems Engineering and Architecting for Edge Computing
- Data Engineering and Analytics
- Sustainable Mobility and Traffic