Ayushman Choudhuri

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Education

RWTH Aachen University — **Oct 2021 - August 2025**
MSc. Robotic Systems Engineering — *Germany*

Manipal University — **August 2014 - June 2018**
B.Tech Mechanical Engineering — *India*

Technical Skills

Programming: Python, C++, C

Frameworks & Libraries: ROS2, Pytorch, ONNX, Tensorflow, TensorRT, OpenCV, CUDA, Deepstreamer

MLOps: MLFlow, DVC, AWS Sagemaker, Terraform, Fiftyone

Developer Tools: Git, Docker, VS Code, Conda, CMake, Gazebo, RViz, Foxglove Studio, Vim, Tmux, Bash

Operating Systems: Linux

Languages: English (Native), German (B1)

Work Experience

Robotics Software Engineer - Computer Vision — **December 2024 – Present**
Schmiede.one GmbH (Innovation lab of the Grimme group) — *Düsseldorf, Germany*

- Building ROS2 object detection pipelines and custom vision algorithms for the Farmsort.one optical sorter, supporting real-time classification and sorting of agricultural produce.
- Designed and optimized a MLOps pipeline to convert raw image data into deployable models, reducing manual effort by 85% and accelerating release cycles.
- Deployed and maintained production software and machine learning models while resolving on-site customer issues to ensure stable and efficient system performance.

Master Thesis Student - Autonomous Driving — **May 2024 – July 2025**
Institut für Kraftfahrzeuge (ika) RWTH Aachen University — *Aachen, Germany*

- Researched and developed an attention map based methodology to make real time 3D object detection using transformer models more explainable.
- Developed a ROS2 based pipeline to ingest LiDAR point clouds and display 3D object detection as well as saliency maps in real time.

Working Student - Computer Vision and Robotics — **March 2024 – November 2024**
Schmiede.one GmbH (Innovation lab of the Grimme group) — *Düsseldorf, Germany*

- Developed and field-validated a proof-of-concept standalone harvest quality assurance system (QualiCam) at customer farms to assess crop harvest quality in real-world conditions.
- Developed quantization and deployment pipelines for YOLO-based object detection models using TensorRT on NVIDIA Jetson Orin NX platform.

Intern - Computer Vision and Robotics **August 2023 – February 2024**
Schmiede.one GmbH (Innovation lab of the Grimme group) *Düsseldorf, Germany*

- Spearheaded the development of a stereo vision–based 3D object detection pipeline for an autonomous harvesters, enabling real-time collision avoidance. This project was showcased at Agritechnica 2023.
- Benchmarked and optimized state-of-the-art detection models on custom agricultural datasets, achieving 5× faster inference through ONNX and HailoRT quantization on Hailo8 edge processors.

Graduate Student Research Assistant **March 2023 – August 2023**
RWTH Aachen University *Aachen, Germany*

- Developed a perception pipeline for safe mobile robot operation in construction environments with a focus on stereo vision-based 3D object detection and LIDAR point cloud compression.
- Designed and deployed a closed-loop LIDAR tilt system to increase the vertical field of view by 100% for close-range applications. The ROS package was developed using C++ and deployed on an NVIDIA Jetson Xavier platform.
- Conducted literature research and documented the existing object detection models as well as point cloud compression methods.

Software Developer - C++ **May 2020 – May 2021**
Synedyne Systems *Bangalore, India*

- Developed and implemented machine learning–based calibration algorithms on an edge device to estimate the payload of a self-loading cement mixer truck.
- Achieved a weight estimation accuracy of 98.5% with a maximum payload of 800 Kg.

Robotics Research Engineer **July 2019 – April 2020**
Indian Institute of Science *Bangalore, India*

- Designed and developed control software (C/C++) and a robotic test bed for precise liquid dispensing for composite manufacturing at the Department of Aerospace Engineering.
- Achieved an accuracy of up to +/- 10 microliters using a MEMS-based flow sensor.

Robotics Systems Engineer **July 2018 – July 2019**
Agilebot Automation *Bangalore, India*

- Worked on a AS/RS robotic system design for automating processes in medium and large scale warehouses.
- Developed the chassis and frame design for a pick and place autonomous rover module for medium scale warehouses.

Projects and Hackathons

- **Master Thesis**| Lab Link
  Explainable Transformer-based 3D Object Detection in LiDAR Point Cloud
- **TUM.ai Hackathon 2024** | Github Link
  Developed a multimodal AI system to detect and analyse deforestation from satellite images.
- **TUM.ai Hackathon 2023** | Github Link
  Developed an LLM-based AI consultant, tailored for the German Automotive Mittlestand.
- **Fraunhofer ICNAP Hackathon 2022**
  Developed a Time Series Classifier of Engine Data using Transformers. Won the 3rd place
- **RWTH Hackmining Hackathon 2022**
  Developed an automatic wear monitoring system using sensor data from a Komatsu 550t excavator.