

AYUSHMAN CHOUDHURI

ROBOTICS & COMPUTER VISION ENGINEER



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PROFILE

Robotics Software Engineer with 5+ years of experience building production robotic systems at scale. Specialized in low latency 2D/3D object detection, multi sensor fusion (camera, LiDAR, IMU) and embedded deployment on NVIDIA Jetson platforms. Skilled across the full stack from camera-based ROS2/C++ perception pipelines and model quantization to MLOps for production edge deployment. MSc in Robotic Systems Engineering, RWTH Aachen University.

WORK EXPERIENCE

Robotics Software Engineer - Computer Vision

December 2024 – Present

Schmiede.one GmbH (Innovation lab of the Grimme group)

Düsseldorf, Germany

- Own QualiCam, a ROS2 and NVIDIA Jetson-based real-time optical perception system for agricultural harvest quality assurance, end-to-end from architecture through field deployment.
- Own the end-to-end MLOps pipeline (datasets, auto-annotation, training, evaluation), cutting manual effort by 85% and accelerating model release cycles.
- Improve the ROS2 object detection pipeline and custom vision algorithms for the Farmsort.one optical sorter, enabling low latency classification and sorting of agricultural produce.
- Lead deployment and maintenance of production ML models in the field, resolving customer issues to ensure stable, efficient system performance.

Master Thesis Student - Autonomous Driving

May 2024 – July 2025

Institut für Kraftfahrzeuge (ika), RWTH Aachen University

Aachen, Germany

- Developed an attention map-based explainability methodology for real-time, transformer-based 3D object detection, resulting in a peer-reviewed publication at IEEE ITSC 2026.
- Built a ROS2 pipeline to visualize detections and saliency maps on LiDAR point clouds 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 a proof-of-concept for QualiCam, a standalone harvest quality assurance system, and validated it at customer farms to assess crop quality under real-world conditions.
- Built quantization and deployment pipelines for YOLO-based object detection models using TensorRT on the NVIDIA Jetson Orin NX platform.

Intern - Computer Vision and Robotics

Schmiede.one GmbH (Innovation lab of the Grimme group)

August 2023 – February 2024

Düsseldorf, Germany

- Spearheaded development of a stereo vision-based 3D object detection pipeline for an autonomous harvester, enabling real-time collision avoidance; showcased at Agritechnica 2023.
- Benchmarked and optimized state-of-the-art detection models on custom agricultural datasets, achieving 5x faster inference through ONNX and HailoRT quantization on Hailo-8 edge processors.

Graduate Student Research Assistant

RWTH Aachen University

March 2023 – August 2023

Aachen, Germany

- Developed a real-time perception pipeline for safe mobile robot operation in construction environments (stereo vision-based 3D object detection, LiDAR point cloud compression) and a closed-loop LiDAR tilt system that increased vertical field of view by 100%, deployed in C++/ROS on an embedded NVIDIA Jetson Xavier platform.

Software Developer - C++

Synedyn Systems

May 2020 – May 2021

Bangalore, India

- Developed machine learning-based calibration algorithms for an edge device to estimate the payload of a self-loading cement mixer truck, achieving 98.5% weight-estimation accuracy up to 800 kg payload.

Robotics Research Engineer

Indian Institute of Science

July 2019 – April 2020

Bangalore, India

- Designed control software (C/C++) and a robotic test bed for precise liquid dispensing in composite manufacturing, achieving accuracy of ± 10 microliters using a MEMS-based flow sensor.

Robotics Systems Engineer

Agilebot Automation

July 2018 – July 2019

Bangalore, India

- Designed an AS/RS robotic system and chassis for a pick-and-place autonomous rover module for medium- and large-scale warehouse automation.

SKILL SET

Programming Languages	C/C++ , Python
Frameworks	PyTorch, ROS2, TensorRT, CUDA, Gstreamer
Platforms	AWS Sagemaker, Weights and Biases, MLFlow
Tools	Git, Docker, Github Actions, DVC
Languages	English (Native), German (B1)

EDUCATION

RWTH Aachen University

MSc. Robotic Systems Engineering

2021 - 2025

Germany

Manipal University

B.Tech Mechanical Engineering

2014 - 2018

India

RESEARCH PUBLICATIONS

- [1] Towards Trustworthy and Explainable AI for Perception Models: From Concept to Prototype Vehicle Deployment. T. Beemelmans, S. Sharifi, M. Mehrotra, **A. Choudhuri**, L. Eckstein. IEEE International Conference on Intelligent Transportation Systems (ITSC), 2026. [arXiv:2605.16087](https://arxiv.org/abs/2605.16087)