MUHAMMAD AMMAR TAUQIR

M.Sc. Automation and Robotics

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https://github.com/Ammartauqir

EXPERIENCE

E.Solutions GmbH

Software Developer

Nov 2022 – Continued Ingolstadt, Germany

- Working on automotive infotainment system testing tools development.

Alten GmbH

Engineering Consultant

Nov 2021 – Nov 2022 Ingolstadt, Germany

- Working as an external in E.Solutions GmbH, on automotive infotainment system development and testing.

Continental AG (ADAS)

Internship & Master Thesis

Nov 2020 – Aug 2021 Neu-Ulm, Germany

- Performed LIDAR point-cloud semantic segmentation, using ML algorithms. Performed cross-dataset training, evaluations and ablation studies for result optimization.

TU Dortmund (FLW - InnovationLab)

Research Assistant

Mar 2019 – Oct 2020 Dortmund, Germany

- Worked on development of camera-based localization system for logistic halls. Achieved pose estimation of objects using multi-view camera observation and 3D projective geometry.

AVIACELL Technologies GmbH (Automotive ADAS)

Embedded Systems Engineer

Aug 2017 – Oct 2018 Lahore, Pakistan

- Worked on algorithm development of ADAS systems and their implementation on embedded ECUs. Got hands-on with CAN technology, Restbus simulation and AUTOSAR standards.

Space & Upper Atmosphere Research Comm.

Internship

June 2017 – Sep 2017 Lahore, Pakistan

- Deployed troposphere impairment prediction model for satellite signals & applied mitigation techniques [3].

ACHIEVEMENTS

1. **Technology Award** in National Invention to Innovation Summit 2017, for vehicle utility control device

EDUCATION

M.Sc. Automation & Robotics (Grade: 1.9)

Technical University Dortmund, Germany

Oct 2018– Aug 2021

- **Thesis:** LIDAR pointcloud Semantic Segmentation for road scenes [1]

B.Sc. Electrical Engineering (Grade: 1.6)

University of the Punjab, Pakistan

Nov 2013 – Mar 2017

- **Thesis:** Autonomous path planning for mobile robots [4]

INTERESTS

Software Testing | Embedded Systems | LIDAR | Robotics | Machine Learning | Sensor Fusion | Projective Geometry | Autonomous Driving | Parallel Comp.

SKILLS

Python	●●●●○
PyTest	●●●●○
PyTorch	●●●●○
Scikit-learn	●●●●○
OpenGL	●●●●○
C / C++	●●●○○
OpenCV	●●●○○
Matlab/Simulink	●●●●○
Linux (Ubuntu)	●●●●○
ROS	●●●○○
Bash Scripting	●●●○○
Git / Docker	●●●●○
LaTeX	●●●●○
SQL	●●●○○
Blender / CAD	●●●○○

Raspbary Pi & Odroid	●●●●○
Jetson TX2	●●●○○
CAN / I^2C / SPI protoclols	●●●○○

2. **Won 2 nd Prize** on concept poster presentation at International Workshop on Field and Assistive Robotics.
3. **Elected Cabinet Member** (1 year) of PSAD student association, in AStA TU Dortmund.

PUBLICATIONS

[1] A. Tauqir, B. Wang (2021). LIDAR Semantic Segmentation Cross-Dataset Learning and Evaluation. Manuscript submitted for publication (IEEE ICRA 2022).

[2] Huang, Y., Wu, Ammar T., Hakert, C., von der Brüggen, G., Chen, K. H., Chen, J. J., ... & Wang, Y. (2020, April). Demo Abstract: Perception vs. Reality-Never Believe in What You See. In 2020 19th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN) (pp. 363-364). IEEE.

[3] Shakeel-ur-Rehman, Tauqir, M. A., & Iqbal, M. (2017). Performance Analysis of Millimeter Wave in Satellite-Earth Systems. INTERNATIONAL JOURNAL OF COMPUTER SCIENCE AND NETWORK SECURITY, 17(7), 258-266.

[4] Ullah, A., Muazzam, H., Tauqir, M. A.,& Mehmood, B. T. (2016, December). Comparative analysis of motion planning techniques for autonomous mobile robots. In 2016 International Conference on Open Source Systems & Technologies (ICOSST) (pp. 23-28). IEEE.

[5] Khan, M. K., Tauqir, A., Muazzam, H., & Butt, O. M. (2016). Design of an autonomous surveillance quad copter. Journal of Quality and Technology Management, 13(1).

SOFT SKILLS

Consistent Learner | Collaborator | Adaptable | Time Manager | Self-driven

LANGUAGES

English
German

REFEREES

Dr. Wang Bihao
Continental AG – ADAS AMS
Master Thesis Supervisior
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Managing Director
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May 5, 2025

PROJECTS COMPLETED

LIDAR semantic segmentation [1]

Implemented a point-wise classification algorithm for LIDAR point-cloud. The project involved 3D voxelization of data, writing a 3D convolution-based U-net, training and testing the model.

Breathing pattern detector

Developed a system of non-invasive inhale and exhale detector for a theater project. Used thermal camera as a sensor and implemented nose-tracking on thermal images.

Camera based pose estimation

Developed a camera-based 3D pose estimation system. Implemented object detection & feature analysis for extracting key points then used multi-view triangulation for depth estimation.

Indoor security verification system [2]

Worked in a team for development of Camera & Bluetooth based localization systems. A collective databased received information and generated output signals after cross verification.

Robot path planning [4]

Used artificial potential field algorithm for autonomous traversal of a robot in a known environment. Genetic optimization was implemented for enhancing adaptability of the system.

Speed-cam

Developed single camera-based vehicle speed estimator. The algorithm used car tracking and linear regression for vehicle distance estimation, then used frame differential information for speed calculation.

Visual SLAM

Used single monocular camera to develop a system that generated odometry data using key feature analysis then implemented loop closure for simultaneous tracking and mapping of the space.

Lane departure warning system

The system employed lane detection using a trained HAAR- classifier, then used perspective transformation and curvature fitting to detect lane and generate departure warnings.

Image dehazing

Used Dark-Channel Prior algorithm that improved the visibility of foggy images by subtracting estimated air-light from captured outdoor images.