

Dr.-Ing. Ahmad Goudah

Senior Computer Vision & Perception Engineer

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PROFILE

Senior Computer Vision and Perception Engineer with a Dr.-Ing. in Mechatronics from the University of Duisburg-Essen. Built camera and 3D LiDAR detection and sensor fusion pipelines for a 105 m vessel and an instrumented road vehicle, reaching 3.3 ms A100 inference per 640x640 image. Brings 15+ years of production software team leadership to Senior Perception and Sensor Fusion roles in Germany.

CORE SKILLS

Computer Vision & Deep Learning: Object Detection, PyTorch, YOLO, OpenCV, Image Stitching, Transfer Learning, Scene Understanding, TensorFlow

3D Perception & Sensor Fusion: Multi-Sensor Fusion, 3D LiDAR, 3D Point Clouds, Open3D, K-Means Clustering, Distance Estimation, RTK DGPS & AIS

Programming & Software Engineering: Python, C++, C, C# / .NET, Scikit-Learn, SQL Server, Git, CI/CD

Embedded, Simulation & Compute: Linux, CUDA, CARLA Simulator, Unity 3D, Raspberry Pi, ESP32, Modbus RTU

LANGUAGES

Arabic (Native) | English (Fluent) | German (Basic)

PROFESSIONAL EXPERIENCE

Doctoral Researcher, Perception & Sensor Fusion

Jun 2019 - Feb 2025

University of Duisburg-Essen, Duisburg, Germany

EU EFRE-funded AutoBin project with DST, SRS, and HGK Shipping across a 105 m inland vessel, an instrumented road vehicle, and driving simulation.

- Resolved buoy misclassifications and 5 missing waterway classes across 6 YOLO baselines by training one 85-class YOLOv8x model for road and water in PyTorch, reaching 0.960 person AP, 0.857 crane validation mAP@0.5, and 3.3 ms A100 inference per 640x640 image.
- Addressed camera darkness and glare limits by projecting 1,000 3D LiDAR scans into height-encoded maps with Open3D for a parallel 6-class YOLOv8 detector and 8-cluster K-Means ranging, localizing buoys, bridges, and shorelines from roughly 38 m to 285 m.
- Unified disconnected trial logs recorded by the AutoBin team on a 105 m vessel by fusing 6 cameras, 2 LiDARs, 20 Hz RTK DGPS, and AIS into a Multi-Sensor Fusion web tool with OpenCV stitching, diagnosing glare and hull occlusions.
- Built a 300 ms road-vehicle sensor platform pairing ESP32 and Raspberry Pi 4 over Modbus RTU to log LiDAR, 4 GPS, 5 ultrasonic, and IMU streams for Unity 3D replay, and applied a CNN+LSTM pre-collision risk approach in CARLA simulation.

Data Scientist, Team Leader & System Developer

Mar 2009 - Present

Arab Academy for Science, Technology and Maritime Transport (AASTMT), Alexandria, Egypt

University software and data engineering unit; owned institutional platforms and data systems (remote advisory during German doctorate, 2019-2025).

- Led a team of 4 engineers automating university workflows across 4 core platforms (admissions, payroll, elections, surveys) and the publishing portal (apc.aast.edu) in **C#**, **ASP.NET Core**, **SQL Server**, and **CI/CD**, serving thousands of students and staff in production.
- Replaced manual spreadsheet reporting across 3 institutional domains (HR, purchasing, and student outcomes) by building interactive Business Intelligence KPI dashboards and tuning **SQL Server** queries and **REST APIs**, cutting recurring executive report generation from days to minutes.
- Addressed smart-grid phase unbalance and demand uncertainty by developing Machine Learning models for 24-hour active power forecasting and **Genetic Algorithms** for three-phase load balancing in **Python** and **MATLAB**, validating results across 4 peer-reviewed energy studies.

Part-Time Lecturer

Oct 2009 - Present

University of Duisburg-Essen, Alexandria University, and AASTMT, Germany & Egypt

- Supervised 10+ automated driving and robotics theses to completion and taught **Python** and **C++** computer vision and embedded labs to hundreds of students across 3 universities.

Founder, Web Developer & Support Engineer

Jan 2005 - Feb 2009

Al-Amal, Toyota Abdul Latif Jameel (ALJ), and Noortech, Alexandria & Jeddah

- Founded Al-Amal to design and ship commercial **AVR Microcontroller** LED displays in **C/C++**, and built automated cheque, archiving, and access-control software for Toyota ALJ and Noortech.

EDUCATION

Dr.-Ing. in Mechatronics

Jun 2019 - Feb 2025

University of Duisburg-Essen, Germany

Grade: gut (cum laude). Thesis: real-time multi-sensor perception for automated vehicles and inland vessels.

M.Sc. in Computer Engineering

May 2010 - Dec 2013

AASTMT, Alexandria, Egypt

B.Sc. in Computer Engineering

Jan 2001 - Feb 2006

AASTMT, Alexandria, Egypt

PUBLICATIONS

- Goudah, A. A., Jarofka, M., El-Habrouk, M., Schramm, D., & Dessouky, Y. G. (2023). Object Detection in Inland Vessels Using Combined Trained and Pretrained Models of YOLO8. ACE, 3(2).
- Goudah, A. (2025). Real-time Detection Models for Surrounded Environmental Objects in Highly Automated Vehicles and Inland Vessels. Dr.-Ing. Thesis, University of Duisburg-Essen.

Plus 4 further papers on machine learning power forecasting and genetic-algorithm smart-grid load balancing.

Academic reference available upon request from Prof. Dr.-Ing. Dieter Schramm, University of Duisburg-Essen.