

# Yousif M. Elsheikh M.

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## EDUCATION

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### Technische Universität Kaiserslautern

2024

*Master of Science in Mechanical Engineering and Process Engineering with Specialization in Vehicle Technology* Kaiserslautern, DE

- *Thesis:* Reinforcement Learning on Sensor Data and Reaction Grid Maps, Robotics Systems Group
- *Relevant Courses:* CVT Programming Project, Embedded Intelligence, Machine Learning, Autonomous Mobile Robots, Robust Control, Human-Machine Systems Design, Robot and Motion Control, Seminar Electromobility
- *Projects:*
  - I. “Genetic Algorithm-Based Optimal Control of the Inverted Pendulum System” – Scientific Writing & Publishing.
  - II. “Application of Iterative LQR on Simple Robot Dynamics” – Seminar Electromobility.

### University of Khartoum

2016

*Bachelor of Science in Mechanical Engineering*

Khartum, SD

- Second Class, Division One – Thesis in Control Engineering

## PROFESSIONAL EXPERIENCE

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### IPG Automotive GmbH

Dec 2023 – Present

*Simulation Backend Working Student*

Karlsruhe, DE

- Development and Implementation of SIL-based V2X Communication such as Collective Perception Message (CPM) according to European/North American standards in CarMaker, using C code for variable computation.
- Responsible for extending and version control of the V2X interface in collaboration with the development team.
- Achievements – Implemented CPM messages and their integration into the interface.

### Adam Riese GmbH

Nov 2022 – Sep 2023

*Computer Vision Working Student*

Stuttgart, DE

- Literature review, training, and evaluation using Python and PyTorch for the implementation of YOLO v7 in a multi-stage object detection pipeline in ONNX runtime.
- Further development of the pipeline for improved performance, including version control.
- Achievements – Trained, validated, benchmarked, and deployed the entire pipeline (live since Aug 2023).

### WIS (Würth Industrie Service GmbH & Co. KG)

Mar 2022 – Sep 2022

*Machine Learning Development Intern*

Bad Mergentheim, DE

- Literature review, development, and application of 3D computer vision state-of-the-art techniques (PointNet/++, VoteNet, MobileNet-V2 etc.) for object localization and recognition for a robotic manipulator/gripper.
- GPU-accelerated training, evaluation, and testing of developed methods.
- Achievements – Successfully implemented 2D detection for computing the Z dimension using point cloud data and mapping to image frame – Confirmed the feasibility of directly learning the point cloud by VoteNet.

### Technische Universität Kaiserslautern

Jul 2021 – Mar 2022

*Student Research Assistant*

Kaiserslautern, DE

- I. *RRLab (Robotics Research Lab):* Literature review, dataset generation, underwater object detection using FLS sonar data, and development of image processing algorithms in MATLAB & Finroc/C++. Validation through outdoor tests.
- II. *Dept. of Mechanical & Process Engineering:* Using GANs and autoencoders to generate GPR sensor data.

### Hi-Force Engineering Works

Aug 2018 – Feb 2019

*Design Engineer*

Khartum, SD

- Design conception and implementation of design improvements using 3D modeling tools for cost reduction and functionality enhancement, including market research and design standardization.
- Achievements – Prepared complete technical and cost proposals winning a waterworks project (over 100k €).

### University of Khartoum

Dec 2016 – Dec 2017

*Teaching Assistant*

Khartum, SD

- Conducted and managed tutorial sessions. Supervised subjects included: Fluid Mechanics I, Computer Applications, Measurement and Instrumentation, and Hydraulic & Pneumatic Power Transmission.

### BASHIR MOTORS CO. LTD.

Mar 2014 – Apr 2014

*Intern*

Khartum, SD

- Training in the maintenance cycle and test specifications/inspection of Nissan vehicles.

## ADDITIONAL INFORMATION

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- *Skills:* Simulation, Machine Learning, Reinforcement Learning, Computer Vision, Deep Learning, Autonomous Driving, Linux, Unreal Engine, CarMaker, Docker, C/C++, Python (Stable Baselines, conda, PyTorch, TensorFlow/Keras, Open3D, Pandas, NumPy), Git, ROS/2, Finroc, OpenCV, CAD (SolidWorks, MATLAB + Simulink), MS Office Suite, MS Visual Studio/VS Code, Research • *Languages:* German (C1/DSH 2; LMU München, TU Kaiserslautern), English (IELTS), Arabic (Native)