

Abdelrahman Elsaid Elsaywy

Robotics and Vehicle Simulation Engineer

ROS/ROS2 | BeamNG.tech | NVIDIA Isaac Sim | RL Training | ONNX | Automated QA

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LinkedIn QR

Summary

Robotics and software engineer with 6+ years of experience in ROS/ROS2, system integration, autonomous systems, and high-fidelity vehicle simulation. Specialized in connecting simulation platforms with robotics and engineering toolchains, including BeamNG.tech, ROS/ROS2, MATLAB, and Simulink. Experienced in API bridge development, real-time simulation control, data acquisition, automated QA testing, regression analysis, issue investigation, technical support, and customer-facing engineering for B2B simulation workflows. Additional focus areas include NVIDIA Isaac Sim, reinforcement learning training workflows, ONNX model deployment, and ANN-based research analysis using MATLAB.

Core Skills

Robotics: ROS, ROS2, SLAM, MoveIt, Gazebo, RViz, autonomous navigation, sensor fusion

Simulation: BeamNG.tech, NVIDIA Isaac Sim, vehicle simulation, high-fidelity simulation, simulation workflows

AI and Model Deployment: Reinforcement learning, RL training workflows, ONNX, artificial neural networks, ANN-based analysis

Programming: C, C++, Python, Lua, SQL, Bash, XML, JSON

Integration: API bridges, system integration, real-time simulation control, data acquisition, MATLAB, Simulink

Testing and QA: automated QA testing, regression testing, bug reproduction, root-cause analysis, issue investigation

Hardware: Arduino, ESP32, Raspberry Pi, LiDAR, IMU, ultrasonic, SPI/I2C/UART, PCB design, soldering, prototyping, Catia

Tools: Git, Docker, Ubuntu, Zendesk, API documentation

Professional Experience

Research Software Engineer

Nov 2021 – Present

BeamNG GmbH

Remote

- Integrated BeamNG.tech with ROS/ROS2, MATLAB, and Simulink for high-fidelity vehicle simulation, robotics workflows, and autonomous systems development.
- Developed and maintained API bridges for real-time simulation control, vehicle interaction, data acquisition, and external tool integration.
- Performed automated QA testing, regression analysis, and issue investigation using C++, Python, and Lua to improve engine stability, simulation reliability, and integration quality.
- Investigated customer-reported and internally detected technical issues by reproducing bugs, inspecting API behavior, analyzing scenario structures, identifying root causes, and providing fixes, workarounds, or implementation guidance.
- Supported global B2B clients through Zendesk by resolving simulation, API, ROS/ROS2, MATLAB/Simulink, and integration-related issues.
- Improved developer-facing documentation for BeamNG.tech API usage, MATLAB/Simulink workflows, tutorials, HIL/DIL material, and integration guidance.
- Converted recurring QA and customer support findings into reusable test cases, documentation improvements, and actionable product feedback to improve developer experience.
- Contributed across BeamNG.tech engineering repositories, including BeamNGpy, API documentation, simulation workflows, QA fixes, tutorials, and integration examples.
- Implemented and validated scenario and mission-loading workflows, including programmatic scenario discovery, scenario loading, vehicle retrieval, sensor attachment, vehicle connection, scripted control, and sensor polling.

Mechatronics Systems Engineer

Feb 2020 – Jul 2021

Ideasparq Robotics Sdn Bhd

On-site

- Developed ROS-based control systems and autonomous navigation solutions for service robots.
- Implemented sensor fusion algorithms and tested robotic platforms using Gazebo, RViz, Docker, and Ubuntu-based robotics workflows.

- Worked on robotic system integration across software, sensors, control logic, simulation, and deployment environments.

Autonomous Robotics Engineer **ENDSTRUCT**

Jun 2019 – Jan 2020
On-site

- Developed autonomous navigation and health monitoring systems for GOVTECH mobile robots.
- Worked on mobile robotics software involving navigation, monitoring, and field-oriented robotic system behavior.

Research Assistant

Sep 2019 – Dec 2019

Autonomous Vehicle Laboratory

- Processed 3D LiDAR data for real-time object detection.
- Developed ROS-based middleware for sensor abstraction and autonomous vehicle research workflows.
- Applied artificial neural network concepts for engineering research analysis and model-based prediction workflows.

Mechatronics Intern

Jun 2018 – Sep 2018

University Malaysia Pahang

- Gained hands-on experience with TurtleBot3 and ROS robot simulation.

Selected Technical Contributions

- BeamNG.tech integration with ROS/ROS2, MATLAB, and Simulink.
- BeamNGpy and API bridge development for real-time simulation control and data access.
- Scenario and mission-loading validation for automated simulation workflows.
- QA automation, regression testing, bug reproduction, and root-cause analysis.
- Customer-facing engineering support for global B2B simulation users.
- Documentation improvements for APIs, tutorials, integration workflows, MATLAB/Simulink, and HIL/DIL material.
- Robotics simulation and integration using ROS, Gazebo, RViz, Docker, Ubuntu, and NVIDIA Isaac Sim.
- Reinforcement learning training workflow awareness for robotics and simulation-based autonomous systems.
- ONNX model deployment awareness for portable AI model exchange and inference workflows.
- ANN-based engineering research analysis using MATLAB-oriented workflows.

Education

Bachelor of Engineering in Mechatronics, Robotics, and Automation Engineering UMPSA Universiti Malaysia Pahang Al-Sultan Abdullah

2016 – 2020

Publication

The Flexural Strength Prediction of Porous Cu-Sn-Ti Composites via Artificial Neural Networks

The 6th International Conference on Robotics Intelligence and Applications, 2018

DOI: 10.1007/978-981-13-8323-6_34

Courses & Certifications

- Level C1 in English – Busuu (May 2025)
- Level A1 in German Language – Busuu (Nov 2024)
- Relational Databases with SQL – Manara (Nov 2024)
- Data Analysis Basics Using Google Sheets – Coursera (Oct 2024)
- Foundations of Databases – Manara (Oct 2024)
- Lua Scripting: Master Complete Lua Programming from Scratch – Udemy (Nov 2023)
- Data Protection Basic Training (EU) – Mitarbeiterschule GmbH (Sep 2023)
- Learn ROS2 as a ROS1 Developer and Migrate Your ROS Projects – Udemy (Nov 2022)
- Level 2: Simulation & Hardware Implementation for SLAM – Udemy (Nov 2022)
- Getting Started with Azure DevOps Boards – Coursera (Oct 2022)
- Command Line in Linux – Coursera (Sep 2022)
- Arduino Workshop – Core Electronics (Sep 2022)
- Open-Source Software Development Methods – The Linux Foundation (Oct 2021)
- Python Scripting for DevOps Specialization – LearnQuest (Sep 2021)
- Python Scripting: Files, Inheritance, and Databases – LearnQuest (Sep 2021)
- Web Application Technologies and Django – University of Michigan (Sep 2021)
- AWS Cloud Technical Essentials – AWS (Aug 2021)
- DevOps and Build Automation with Python – LearnQuest (Aug 2021)

- Python Scripting: Dates, Classes, and Collections – LearnQuest (Aug 2021)
- Configuration Management and the Cloud – Google (Aug 2021)
- Introduction to Git and GitHub – Google (Jul 2021)
- Technical Support Fundamentals – Google (Jul 2021)
- Troubleshooting and Debugging Techniques – Google (Jul 2021)
- Using Python to Interact with the Operating System – Google (Jun 2021)
- Crash Course on Python – Google (May 2021)
- Malaysia Autonomous Vehicle Challenge (MAVeC'19) – MARii (Nov 2018)
- The International Conference of Robotics Intelligence and Applications (RiTA) 2018 – KIIAST SG (2018)
- Boundless Innovation Week – HPMM (Aug 2018)
- CAM Computer-Aided Manufacturing Workshop – The Institution of Engineers, Malaysia (Nov 2017)
- IEM MATLAB Workshop – The Institution of Engineers, Malaysia (Oct 2017)
- Arduino for Beginners Workshop – SPARKTECH Team at IIUM (Nov 2016)
- Online Database Class: SCOPUS – University Malaysia Pahang (Nov 2016)

Languages

Arabic: Native or bilingual proficiency
 English: Professional working proficiency
 Turkish: Elementary proficiency
 German: Elementary proficiency
 Malay: Limited working proficiency