

Eslam Sharaawy

AI Researcher | Data Scientist | Machine Learning Developer

Braunschweig, Germany | +49 1575 3687673 | contact@sharaawy.com | www.sharaawy.com | [LinkedIn](#)

EU Blue Card holder; authorized to work in Germany

PROFESSIONAL PROFILE

AI Researcher, Data Scientist, and Machine Learning Developer with an M.Sc. in Computational Science in Engineering and a Mechanical Power Engineering background. Experienced in scientific machine learning, computer vision, probabilistic modeling, generative AI, foundation models, digital twins, and industrial data science. Proven record developing multimodal ML and CV pipelines for automotive damage assessment, simulation-based prediction, and engineering applications, with measurable improvements in annotation effort, model accuracy, inference speed, and reporting efficiency.

CORE SKILLS

AI / ML: Scientific ML, Deep Learning, Computer Vision, Few-Shot Learning, Object Detection, Semantic Segmentation, Generative AI, Probabilistic Modeling, PINNs, Operator Embeddings, Foundation Models, Classical ML

Programming: Python, SQL, R, C++, C, C#, Java, MATLAB, VBA

Frameworks / Libraries: PyTorch, TensorFlow, Keras, scikit-learn, XGBoost, CatBoost, OpenCV, Detectron2, MMLab, Pandas, NumPy, Matplotlib

Cloud / MLOps / Tools: Docker, Git/GitHub, MLflow, CI/CD, AWS, Azure, Google Cloud, FastAPI, Flask, Streamlit, Gradio, Linux, JIRA, Confluence

Engineering: Digital Twins, Simulation, OpenFOAM, ANSYS, COMSOL, SolidWorks, AutoCAD, Fusion 360, Revit

PROFESSIONAL EXPERIENCE

TU Clausthal | Clausthal-Zellerfeld, Germany | **Nov 2025 - Present**

AI Researcher / Doctoral Researcher

- Conduct AI research across scientific machine learning, probabilistic modeling, generative AI, and foundation models for engineering and real-world systems.
- Develop uncertainty-aware approaches for battery State of Health (SOH) and Remaining Useful Life (RUL) prediction using probabilistic and generative models.
- Model hidden subsurface network structures to identify inflow locations in Lower Saxony from precipitation and environmental data.
- Contribute to foundation models for scientific applications, including physics-informed neural networks (PINNs), operator embeddings, and related AI methods.

Volkswagen Financial Services | Braunschweig, Germany | **Jul 2024 - Apr 2025**

Data Science Intern / Master Thesis

- Developed a multimodal damage-cost prediction pipeline combining ResNet-based visual features with structured vehicle data in CatBoost, reducing RMSE by 43%.
- Built a few-shot object detection pipeline for rare vehicle damages, reducing annotation costs by 35% and enabling faster deployment cycles.
- Accelerated deep learning inference by 35% through hyperparameter tuning, data augmentation, and model optimization.
- Proposed AI-driven process improvements for automotive leasing return workflows and damage assessment.

Volkswagen Financial Services | Braunschweig, Germany | **Mar 2023 - Mar 2024**

Working Student - IT Test Engineer

- Tested and validated new error-tracking systems in close collaboration with development teams.
- Automated recurring VBA reports, reducing manual processing time by 30%.
- Supported daily testing workflows, documentation, and continuous process improvements.

TU Braunschweig - IWF | Braunschweig, Germany | **Sep 2022 - Mar 2023**

Working Student - Institute of Machine Tools and Manufacturing Technology

- Simulated injection-molding machine components under varying process parameters and created predictive models from simulation data.
- Reduced repeated simulation effort and supported digital twin development for monitoring and predictive maintenance.

IT RANKS | Cairo, Egypt | **Sep 2020 - Sep 2021**

Junior System Administrator

- Provided technical support for servers, networks, Exchange migrations, client connectivity, and infrastructure issues.
- Maintained backups, disaster recovery processes, system hardening, documentation, and daily IT operations.

AL-EMAM FOR ENGINEERING & PROJECTS | Cairo, Egypt | **Jul 2019 - Sep 2020**

Technical Project Engineer

- Managed quality control and implementation of mechanical designs for a Siemens infrastructure project in Egypt's New Administrative Capital.
- Prepared progress reports and coordinated technical communication with the client.

EDUCATION

M.Sc. Computational Science in Engineering | Technische Universität Braunschweig, Germany | Sep 2021 - Mar 2025

- Final grade: 2.1 (German grading system); focus on AI, data science, mathematics, programming, statistics, simulation, and physics.
- Master thesis with Volkswagen Financial Services: few-shot computer vision pipeline for rare automotive defect detection, reducing annotation effort by 35%.

B.Sc. Mechanical Power Engineering | Helwan University, Cairo, Egypt | Sep 2014 - Jul 2019

- Graduated with Excellent final-year performance and strong foundations in mathematics, physics, programming, statistics, power systems, and mechanical design.

SELECTED PORTFOLIO PROJECTS (11)

- 1. Battery SOH & RUL Prediction:** Probabilistic and generative models for uncertainty-aware battery health forecasting.
- 2. Foundation Models for Scientific Machine Learning:** Research on PINNs, operator embeddings, and foundation modeling for physical and engineering systems.
- 3. Subsurface Inflow Discovery from Precipitation Data:** AI modeling of hidden underground network structures to identify inflow behavior.
- 4. Semantic Segmentation of Infrastructure Cracks:** CNN/Transformer-based crack detection and segmentation; achieved IoU of 0.91 on test data.
- 5. Risk Modeling for Leasing Returns:** Multimodal ResNet + CatBoost pipeline for automotive damage-cost prediction; reduced RMSE by 43%.
- 6. Few-Shot Object Detection for Rare Automotive Defects:** CV pipeline with minimal annotations; reduced labeling effort by 35%.
- 7. Physics-Informed Neural Networks:** Hybrid neural-network and PDE-based modeling for physical system prediction.
- 8. Digital Twin from Simulation & Experimental Data:** Combined simulation and measurement data for real-time monitoring and predictive maintenance.
- 9. Satellite-Based Natural Disaster Prediction:** ML and statistical analysis of satellite data for early detection and forecasting of disasters.
- 10. Skin Defect Detection & Treatment Recommendation:** Computer-vision prototype for skin-condition detection and treatment recommendation.
- 11. Flat Solar Collector - Design, Simulation & Installation:** Designed and simulated a flat-plate solar collector using CFD/thermal analysis and supported prototype installation.

LANGUAGES

Languages: Arabic (native), English (C1), German (C1), Spanish (basic)