Adnan Karol

Dynamic Data Scientist with expertise in machine learning, deep learning, and data analytics. Skilled in designing and deploying end-to-end solutions using AWS services. Passionate about leveraging data-driven insights and innovative AI technologies to drive strategic decision-making.

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🥧 Experience

Data Scientist
SURU-Part of LIXIL

Aug. 2021 – Present
Düsseldorf, Germany

> **Micro-Leak Detection System:** Developed and deployed a novel algorithm for a leak detection device, leading field tests from house selection to leak simulations. This technology is poised to become a core business and major revenue generator for the company.

> **Customer Image Automation System:** Developed a system to automate high-quality image requests during customer registration, reducing re-upload needs by over **50%** and minimizing installation delays for the Sales team. Created the MLOps architecture and established a pipeline for monthly model retraining to ensure stability and reliability.

> **Gauge of Drops (GOD) Algorithm:** Implemented a deep learning process to identify micro-leakages in homes, enhancing the company's leak detection business. This project is currently **patent-pending** and deployed on AWS services.

> **Pressure Algorithm Enhancement:** Enhanced the performance of the SenseGuard device for pressure measurements by refining scheduling models and improving leakage detection accuracy.

> **Data Extraction Tools:** Designed tools to efficiently retrieve data from data lakes on the AWS big data cloud, reducing manual effort by over **200 hours** per month and enabling sales and after-sales teams to expedite processes and access critical information more quickly.

> Conducted **statistical analyses** of insurance portfolios, assisting management and business leaders in evaluating the viability and profitability of potential partnerships with insurance companies.

> Engineered **Tableau dashboards** to enhance business intelligence, enabling customer service teams to diagnose issues more effectively. Managed the Tableau environment and improved existing dashboards, making them **4x** faster.

Data Science Intern
Vialytics GmbH

Jul. 2020 – Mar. 2021
Stuttgart, Germany

> **Road Damage Detection:** Trained a **YOLOv4** model for road damage object detection on **Oracle Cloud**, leveraging **image data** to improve accuracy and efficiency.

> **Assessment of Road Unevenness:** Implemented a solution to assess road unevenness by utilizing **non-visual smartphone sensors**, specifically the **accelerometer**, which is actively employed in the company's operations.

> **Fault and Anomaly Analysis:** Conducted comprehensive analyses to detect and rectify **outliers** within specific categories of road damage, enhancing data integrity and operational effectiveness.

🎓 Education

University of Stuttgart
Master of Science Information Technology

Oct. 2018 – May 2021
Stuttgart, Germany

> **Master Thesis:** Implemented feature extraction techniques and applied machine learning and deep learning to analyze EEG and ECG signals, comparing their effectiveness in physiological signal analysis.

🧪 Patents, Publications, Projects

GOD: System and method for detecting leakages in a fluid-bearing structure

> Developed a deep learning-based solution to detect micro-leakages in homes, achieving a testing accuracy of **96%**. This innovative project is currently filed for patent protection.

LSTM and CNN Based IMU Sensor Fusion Approach for Human Pose Identification.

> Presented at the Springer International Symposium on Wearable Robotics, WeRob 2020: Wearable Robotics: Challenges and Trends. 🔗

Water Consumption Prediction Service.

> Engineered end-to-end system for forecasting water consumption, encompassing data preprocessing, model development utilizing CNN-LSTM, and model deployment through Docker and Flask. 🔗

classifierAgent: A Machine Learning Classification Python Package

> Created a user-friendly Python package designed for efficient machine learning classification tasks, easily installable via pip. 🔗

YoloV8 Serverless Deployment.

> Successfully deployed the YOLOv8 model on Amazon SageMaker Endpoints, integrating it with AWS Lambda and API Gateway to provide scalable object detection solutions. 🔗

⚙️ Skills

Programming   Python

Machine Learning Libraries   Tensorflow, Keras, OpenCV, Pandas, Scikit-learn, Numpy, Scipy, Matplotlib

Cloud   AWS Cloud (Athena, S3, EC2, Redshift, SageMaker, Lambda, SNS, ETL, Eventbridge, IAM), Oracle Cloud

Databases   Redshift, MongoDB, MySql, SQLite, InfluxDB

Business Intelligence Tools   Tableau, Quicksight

Embedded Systems   Raspberry Pi, Nvidia Jetson Nano, Arduino, ESP32, IMU, EMG sensors

Automation and DevOps Tools   Jenkins, Docker, MLOps, GitHub Actions

Version Control and Collaboration   Git, Agile Methodologies, Confluence, JIRA, Scrum

🈯 Languages

English   C1 *(Business fluent)*

German   A1 *(Basic proficiency)*

✹ Certifications

AWS Certified Cloud Practitioner   Credly Badge

Udemy: AWS Certified Machine Learning Specialty   Certificate