WANIA KHAN

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PERSONAL STATEMENT

Dynamic and results-driven researcher with expertise in advanced data analytics, data visualization, and AI modelling. Skilled in implementing machine learning and deep learning frameworks for predictive analytics and advanced forecasting. Adept at extracting actionable insights from data to solve complex problems and drive informed decision-making for impactful solutions.

WORK EXPERIENCE

Researcher - Chalmers University of Technology, Sweden 2023 – Present

Integrating intelligence into Smart Grid operations using advanced optimization techniques for energy data management.

- Formulated an LP model using advanced Python packages, leveraging large-scale energy data.
- Developing heuristics to enhance system efficiency by up to 50%, focusing on cost-optimization in the residential sector.
- Authoring research paper on *OPTASS for computational efficiency in energy systems* for submission in a conference.

Data Science Intern – Plexigrid, Spain April 2023 – August 2023

Developed a scalable, AI-driven model-free approach for voltage estimation of customers in low voltage (LV) networks.

- Simulated a power system model in Open DSS to test scenarios with heavy-load data from smart meters.
- Conducted comparative analysis of three ML models; Logistic Regression, XGBoost, and Artificial Neural Networks.
- ANN achieved over 90% accuracy in predicting customer voltage magnitudes using historical smart meter data.

Data Science Intern – ENEA Portici Research Center, Italy January 2022 – August 2022

Demonstrated advanced data analytics modelling for data center (DC) energy management at ENEA Portici Research Center.

- Conducted Exploratory Data Analysis (EDA) on real-time HPC cluster large dataset, utilizing data cleansing and transformation techniques.
- Achieved 98% prediction accuracy in thermal classification of DC IT rooms using Decision Tree, outperforming other ML models including Random Forest, Logistic Regression, and SVM.
- Implemented LSTM model for advanced prediction of DC resource utilization, attaining up to 97% accuracy in forecasting.
- Applied SARIMA modelling to forecast time-series data of energy consumption and waste in DC.

Awards: Certificate of Best Master Thesis at 6th IFAC Symposium on Telematics Applications in Nancy, France.

EDUCATION

MSc. Green Networking and Cloud Computing - Erasmus Mundus Joint Master's Degree Sep 2020 – Aug 2022

Luleå University of Technology, Sweden | Leeds Beckett University, UK | University of Lorraine, France

Course Modules: Data Analytics and Visualization | Cloud Services | Internet of Things | Green Networking

Awards: Fully Funded Masters Scholarship by European Union

Bachelor of Computer Engineering - Bahria University Islamabad, Pakistan Sep 2015 – July 2019

Course Modules: Artificial Intelligence | Data Structures and Algorithms | Database Management System | Distributed Computing

Awards: Silver Medal for academic excellence.

TECHNICAL SKILLS

- **Languages**: Python (NumPy, Pandas) , SQL, MATLAB, Java, and C++.
- **Machine Learning**: Scikit-learn, TensorFlow, OpenCV, Deep Learning
- **Data Visualization**: Matplotlib, Power BI, and Tableau.
- **Web Development:** Flask, Node.js, HTML, MySQL, MongoDB
- **Acquainted With:** Hadoop, Spark, AWS, Boto3, Docker, EDA/ETL, Agile and Scrum methodologies.

PUBLICATIONS

- **Wania Khan**, Davide De Chiara, Ah-Lian Kor, and Marta Chinnici (2022). Exploratory data analysis for data center energy management. In Proceedings of the Thirteenth ACM International Conference on Future Energy Systems (e-Energy '22). Association for Computing Machinery, New York, NY, USA, 571–580. https://doi.org/10.1145/3538637.3539654
- **Wania Khan**, Davide De Chiara, Ah-Lian Kor, and Marta Chinnici. (2023). Advanced Data Analytics Modelling for Evidence-based Data Center Energy Management, Journal Physica A: Statistical Mechanics and its Applications. https://doi.org/10.1016/j.physa.2023.128966.

PROFESSIONAL SKILLS

- Possess good communication and time management skills with competence in the English language (C2 Level).
- Strong interpersonal, negotiation and presentation ability to share knowledge, trends, and process flows.
- Quick-learner, flexible and able to work both in teams as well as individually.

CERTIFICATIONS

- Data Analytics on AWS, Amazon Web Services (AWS), Coursera
- Big Data Integration and Processing, University of California San Diego – Coursera
- Big Data and Hadoop Framework, Udemy
- Elements of AI, University of Helsinki, Reaktor

ACADEMIC PROJECTS

Advanced Prediction Analysis of Electricity Consumption

- A research and design-based project for prediction of domestic electricity consumption in UK.
- Achieved 95% prediction accuracy in forecasting household energy consumption using ML classification and regression models.
- Applied deep neural network model for time series forecasting of household carbon footprint.

Key Technologies: Python, Pandas, Scikit-Learn, Machine Learning and Deep Learning, Classification, Regression Analysis.

Smart Glove – Awarded 3rd Prize for Best Final Year Project

- Sign language translator – a robotic glove developed for speech-impaired people to translate their real time hand gestures into speech and text using AI technology.
- Conducted real-time data collection at university followed by exploratory data analysis and machine learning application.
- Achieved over 90% accuracy in gesture prediction using SVM outperforming, decision tree, Logistic Regression and Random Forest.

Key Technologies: Big Data Analysis, Pandas, NumPy, scikit-learn, ML Classification and Regression Modelling.

Real-Time Noise level Monitoring – Awarded 1st Prize at Arctic Hackathon, Sweden

- Aimed to resolve a social problem in a team by developing a user-friendly website.
- Monitored the real-time noise level, stored the data, and processed in Arduino for noise pollution prevention.

Key Technologies: Arduino, Python, Restful services, Flask HTML, CSS, JS

Big Data Analysis using Apache Spark

- Implemented a design-based project in AWS elastic compute cloud.
- Deployed a single node cluster in the virtual machine to perform real-time wordcount problem using MapReduce in Apache spark.

Key Technologies: AWS Elastic Compute Cloud, Apache Spark, Big data, MapReduce.

HONOURS AND AWARDS

- Certificate of Academic Honour on achieving Cum Laude in bachelors.
- Higher Education Commission Scholarship (2016-2019) from Government of Pakistan.
- Merit Scholarships during undergraduate by honourable Rector of Bahria University, Pakistan.