UMER MAJEED

AI Engineer

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scholar.google.com
user=LrsLEJgAAAAJ
Citations: 650+

SUMMARY -

AI Engineer and Ph.D. candidate in Computer Science & Engineering with expertise in AI, machine learning, and blockchain technologies. Proficient in Python and R, with experience in developing AI-driven solutions for privacy-preserving computation and federated learning. Published researcher with international recognition, dedicated to advancing AI applications in secure and decentralized environments. Eager to contribute innovative AI models and systems to dynamic teams, leveraging strong analytical skills and a deep understanding of cutting-edge technologies.

SKILLS -

PLs & Frameworks: Python, R, TensorFlow, PyTorch, TensorFlow Federated, Keras.

Libraries & Technologies: NumPy, pandas, Matplotlib, Seaborn, scikit-learn, NLTK.

Familar IDEs: JupyterLab/ Jupyter Notebook, PyCharm, VS Code, Google Colab.

Familar OS: Ubuntu, Windows.

KEY RELEVANT PUBLICATIONS - -

Umer Majeed et al., "Cross-Silo Model-Based Secure Federated Transfer Learning for Flow-Based Traffic Classification," ICOIN 2021.
Developed a **federated transfer learning** scheme for traffic classification on **time-related statistical features** using DL and **TensorFlow Federated** on multi-organizational datasets, enhancing accuracy and efficiency through knowledge transfer in a cross-silo setting. Ensured data privacy in federated learning by implementing a **secure aggregation** protocol.

Umer Majeed et al., "Cross-Silo Horizontal Federated Learning for Flow-based Time-related-Features Oriented Traffic Classification," APNOMS 2020.
Developed a **horizontal federated learning** model for **traffic classification** on **TensorFlow Federated**, utilizing flow-based **time-related statistical features** to enhance **data privacy** and **security**. Demonstrated the effectiveness of deep learning techniques in traffic classification in **cross-silo** settings.

Umer Majeed et al., "Vanilla Split Learning for Transportation Mode Detection using Diverse Smartphone Sensors," KCC 2021.
Implemented a **split learning** framework for **transportation mode detection** leveraging **smartphone sensors** to enhance **data privacy** and reduce **client-side computation**. Showed that the **split neural network** achieves comparable performance to traditional deep learning models while being more robust against **inference attacks**.

Umer Majeed et al., "Blockchain-assisted Ensemble Federated Learning for Automatic Modulation Classification in Wireless Networks," KCC 2020.
Proposed an **ensemble federated learning** scheme for **automatic modulation classification** (AMC) using **deep learning** techniques on **decentralized data**. Leveraged a **blockchain network** to enhance model training and demonstrated improved performance of the ensemble model over base federated models in **wireless communication** systems.

RELEVANT CERTIFICATIONS AND MOOCS -

Deep Learning Specialization - Coursera -

This specialization covers key **Deep Learning** concepts like **Neural Networks**, **Back-propagation**, **Regularization**, and **Optimization**, using frameworks such as **TensorFlow**. It includes architectures like **CNNs** and **RNNs**, advanced topics like **GRU**, **LSTM**, **Attention Models**, and **Transformers** for NLP, with a focus on practical implementation and **optimization strategies**.

1. Neural Networks and Deep Learning - Jul. 2021 -
2. Improving Deep Neural Networks - Aug. 2021 -
3. Structuring Machine Learning Projects - Oct. 2021 -
4. Convolutional Neural Networks - Oct. 2021 -
5. Sequence Models - Audit Completed with Labs - Nov, 2024.

DataCamp - - https://www.datacamp.com/portfolio/umermajeed 2017-2018

These certifications cover **Python Basics**, including **Data Types**, **Data Visualization**, and libraries like **Pandas**, **NumPy**, **Seaborn**, and **Matplotlib**. They also include **EDA**, **Statistical Thinking**, **Statistical Analysis**, **Relational Databases**, **SQL**, **SQL JOINs**, **SQL Aggregation**, and tools like **Git/GitHub** and **CLI piping**.

1. Introduction to Python - - 2017
2. Intermediate Python - - 2017
3. Intermediate SQL - - 2017
4. Introduction to Shell - - 2018
5. Functions in Python - - 2017
6. Python Toolbox - - 2017
7. Statistical Thinking (1) - - 2017
8. Statistical Thinking (2) - - 2017
9. Version Control - Git - - 2018
10. Data Types in Python - - 2017
11. Data Visualization - - 2017
12. Data Visualization - Seaborn - - 2018

Private & Secure AI/Data Science Courses - OpenMined -

1. ***Our Privacy Opportunity*** - Completed - Mar. 2021 - Explore structured transparency, **privacy techniques**, and the **privacy-transparency trade-off**.
2. ***Foundations of Private Computation*** - Ongoing - Progress 80% - Implement **federated learning**, **secure multi-party computation**, **homomorphic encryption**, and **differential privacy**.
3. ***Introduction to Remote Data Science*** - Completed - Feb. 2022 - Use **remote execution tools**, deploy **Domain Nodes**, and apply **privacy-preserving techniques** for distributed data science.

IBM Data Science Professional Certificate - Coursera - Audit Completed with Labs -

This certification covers essential **Data Science** skills, including **Data Visualization**, **Data Management**, **Machine Learning**, and **Data Analysis**. It emphasizes hands-on experience with **Python**, **SQL**, and **CRISP-DM**, exploring **Data Pipelines**, **Feature Engineering**, **Big Data**, and **Model Deployment**. Practical projects involve **data collection**, **wrangling**, and **exploratory analysis**, building a solid foundation for a career in data science.

1. What is Data Science? - April 2024
2. Tools for Data Science - April 2024
3. Data Science Methodology - April 2024
4. Python for Data Science, AI & Development - April 2024
5. Python Project for Data Science - April 2024
6. Databases and SQL for Data Science with Python - May 2024
7. Data Analysis with Python - May 2024
8. Data Visualization with Python - June 2024
9. Machine Learning with Python - June 2024
10. Applied Data Science Capstone - August 2024
11. Generative AI: Elevate Your Data Science Career - July 2024
12. Career Guide and Interview Preparation - August 2024

IBM Data Analyst Professional Certificate - Coursera - Audit Completed with Labs -

This certification provides job-ready **Data Analytics** skills, focusing on **data cleaning**, **visualization**, and **dashboards**. It covers tools like **Python**, **Excel**, **SQL**, and libraries such as **Pandas**, **NumPy**, and **scikit-learn**, along with **Jupyter Notebooks**, **Google Looker**, and **Cognos Analytics**. Skills in **EDA**, **predictive modeling**, **generative AI**, and **machine learning** are applied in projects involving dashboard creation and real-world data analysis.

1. Introduction to Data Analytics - Sep. 2024
2. Excel Basics for Data Analysis - Sep. 2024
3. Data Visualization & Dashboards - Excel & Cognos - Sep. 2024
4. Generative AI: Enhance your Data Analytics Career - Sep. 2024
5. Career Guide & Interview Preparation - Oct. 2024

AI For Everyone - Andrew Ng - Coursera - - Completed - Dec. 2019 -

This course provides an overview of **AI terminology**, **strategy**, and **workflows** for machine learning and data science. It addresses **ethical considerations** and **societal impacts** of AI, including **bias** and its effects on various sectors.

PROJECTS & PORTFOLIO -

ML Project - - SpaceX Falcon 9 launches - Kaggle NB - , Dash App - - This project covers key aspects of **machine learning** such as **data collection** (via API and web scraping), **data wrangling**, **exploratory data analysis (EDA)**, and the creation of **visualizations** and **interactive dashboards** using **Plotly Dash** and **Folium**. The project also applies **predictive analysis** through classification techniques to forecast launch success rates.

DL projects - - using TensorFlow, keras, PIL, transformers

1. Simple CNNs - Happyface & Digit hand Signs - - Github
2. ResNet - Digit hand Signs - - Kaggle NB -
3. Transfer Learning - MobileNet - - Kaggle NB -
4. Object Detection using yolov2 - - Github NB
5. Image segmentation using Unet - - Kaggle NB -
6. Face recognition using facenet - - Github NB
7. DL Art - Neural Style Transfer - - Kaggle NB -
8. RNN from Scratch - Dinosaur Island - - Kaggle NB -
9. Text generation - LSTM based RNN - - Kaggle NB -
10. Music Generation - LSTM based RNN - - Kaggle NB -
11. Word Embeddings - Similarity & Debiasing - - Github NB -
12. Emojifier: Expressiveness with Emoji - - Github NB -
13. Neural Machine Translation with Attention - - Github NB -
14. Trigger word detection - from voice - - Kaggle NB -
15. Transformer from Scratch - - Github NB -
16. Explore Positional Encodings - Transformer - - Github NB -
17. Named-Entity Recognition - Transformer - - Kaggle NB -
18. Extractive QA - Transformer - - Kaggle NB -

Exploratory Data Analysis (EDA) Projects - - using matplotlib, plotly, pandas

1. **Tesla and GameStop Stock/Revenue Data** - Kaggle NB - : involves data fetching via `yfinance`, analysis of key metrics, trends, and a summary of **market behavior** and **financial performance**.
2. **Socioeconomic Indicators in Chicago (2008-2012)** - Kaggle NB - : using **pairplots**, **heatmaps**, **correlation matrix**, and **descriptive statistics**.

Dashboard & Visualization Projects - - using Google Looker

1. **Sales and Service Analysis Report for SwiftAuto Traders** - Looker Report - : A comprehensive dashboard analyzing **car sales and service performance**, featuring KPIs like **total profit**, **quantity sold**, and visualizations of **sales by model**, **profit by dealer**, **recalls per model**, **customer sentiment**, and trends in **monthly sales** and **profit**.
2. **Products and Sales Analysis Report for Customer Loyalty Program** - Looker Report - : Detailed insights into **product sales** and **customer loyalty**, with data on **total revenue**, **quantity sold**, and visualizations including **line charts**, **bar charts**, **treemaps**, **gender slicers**, and **revenue by geography** through maps and word clouds.

EDUCATION

2017 - Present — **Master & Ph.D. (Combined) in Computer Science & Engineering** — **CGPA 4.11/4.3**
Department of Computer Science & Engineering, Kyung Hee University, Yongin, South Korea

2011 - 2015 — **BS Electrical (Telecommunication) Engineering** — **CGPA 3.83/4.00**
National University of Sciences & Technology (NUST), Islamabad, Pakistan

EXPERIENCE

2015 – 2016 — **PHP developer** — **Artologics, Islamabad, Pakistan**

- Developed back-end applications with Core PHP and CodeIgniter.
- Used jQuery and JavaScript for AJAX-based UI-server communication, enhancing web app interactivity.
- Utilized SQL queries with MySQL for reliable data management and integrity.

`PHP / SQL / CodeIgniter / jQuery / AJAX / JavaScript / APIs`

LANGUAGES

English - Proficient (written and verbal), **Urdu** - Native, **Korean** -Beginner (TOPIK Level 2)