UMER MAJEED

AI Engineer

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Kaggle umermjd11

CV umermjd11.github.io/cv

github.com/umermjd11

github.com/umermajeedkhu

scholar.google.com/citations?user=LrsLEJgAAAAJ

Citations: 600+

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

⋆ DAO Framework
⋆ ERC-721
⋆ Multi-Signature Contracts
⋆ Non-Transferable Tokens (NTTs)
⋆ IPFS
⋆ Hardhat

Umer Majeed et al., "DAO-FL: Enabling Decentralized Input and Output Verification in Federated Learning with Decentralized Autonomous Organizations," TechRxiv. Preprint, Dec. 2023. **www.github.com/umermajeedkhu/DAOFLcode/tree/main/contracts**

- Developed a decentralized framework for input and output verification in federated learning, enhancing data integrity and security using DAOs and ERC-721 tokens.
- Designed DAO Membership Tokens (DAOMTs) for governance, implementing mintable and soul-bound tokens to facilitate decentralized decision-making in machine learning systems.

⋆ Structured Transparency
⋆ Homomorphic Encryption
⋆ Input & Output Privacy
⋆ Output Verification

Umer Majeed et al., "ST-BFL: A Structured Transparency empowered cross-silo Federated Learning on the Blockchain framework," IEEE Access, Nov. 2021.

- Developed a framework enhancing data privacy in federated learning through structured transparency and homomorphic encryption, ensuring secure handling of sensitive data.
- Implemented output verification and smart contracts for accountability in collaborative machine learning, facilitating reliable model performance validation and effective data management.

⋆ Transfer Learning
⋆ Federated Learning
⋆ TensorFlow Federated
⋆ Secure Aggregation
⋆ Time-related Statistical Features

Umer Majeed et al., "Cross-Silo Model-Based Secure Federated Transfer Learning for Flow-Based Traffic Classification," ICOIN 2021. **https://doi.org/10.1109/ICOIN50884.2021.9333905**

- Developed a federated transfer learning scheme for traffic classification using deep learning 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.

⋆ Deep Learning
⋆ Traffic Classification
⋆ Horizontal FL
⋆ TensorFlow Federated
⋆ Feature Engineering
⋆ Time-related Statistical Features

Umer Majeed et al., "Cross-Silo Horizontal Federated Learning for Flow-based Time-related-Features Oriented Traffic Classification," APNOMS 2020. **https://doi.org/10.23919/APNOMS50412.2020.9236971**

- Developed a federated learning model for traffic classification using flow-based time-related features, enhancing privacy and data security.
- Demonstrated the effectiveness of deep learning techniques in traffic classification, showcasing advanced data analysis methodologies.

KEY RELEVANT CERTIFICATIONS AND MOOCS

⋆ Neural Networks
⋆ Back-propagation
⋆ Hyperparameters
⋆ Regularization
⋆ Optimization
⋆ TensorFlow
⋆ Dropout
⋆ CNN Basics
⋆ Advanced Architectures
⋆ Object Detection
⋆ RNNs
⋆ GRU
⋆ LSTM
⋆ Attention Models
⋆ NLP
⋆ Transformers

Deep Learning Specialization - Coursera

https://www.coursera.org/specializations/deep-learning

- **Neural Networks and Deep Learning - Completed - July, 2021 -** ✹ - Gain a deep understanding of neural networks, implement architectures, and optimize through hyperparameter tuning and regularization.
- **Improving Deep Neural Networks - Completed - August, 2021 -** ✹ - Explore advanced techniques like hyperparameter tuning, optimization algorithms (Adam, RMSprop), regularization methods (dropout, batch normalization), and implement models using TensorFlow.
- **Structuring Machine Learning Projects - Completed - Oct. 2021 -** ✹ - Diagnose errors in ML systems, implement strategies like end-to-end learning and transfer learning, and set human-level performance benchmarks for complex tasks.
- **Convolutional Neural Networks - Completed - Oct. 2021 -** ✹ - Explore CNN layers, advanced architectures like ResNet, apply object detection techniques (YOLO, U-Net), and create models for applications like face recognition and neural style transfer.
- **Sequence Models - In progress** - Implement RNNs, GRUs, LSTMs, and transformers for NLP tasks like machine translation and named entity recognition, and apply attention mechanisms for enhanced performance.

⋆ Generative AI Tools
⋆ Data Augmentation
⋆ Querying Databases
⋆ Feature Engineering
⋆ Ethics in AI
⋆ Data Visualization
⋆ Matplotlib
⋆ Seaborn
⋆ Dash / Plotly
⋆ Geospatial Data
⋆ Dashboards
⋆ ML Models
⋆ Data Pipelines
⋆ DDL / DML
⋆ Advanced SQL
⋆ Python Integration
⋆ Cloud Databases
⋆ CRISP-DM
⋆ Financial Data
⋆ Data Management
⋆ Data Integration
⋆ Model Building
⋆ Model Deployment
⋆ Model Monitoring
⋆ Cloud-Based Tools
⋆ Data Literacy
⋆ ETL
⋆ Big Data
⋆ Data Pipelines

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

https://www.coursera.org/professional-certificates/ibm-data-science

- **Generative AI: Elevate Your Data Science Career - July, 2024** - Learn generative AI tools for data preparation and querying, engage in hands-on labs, explore real-world use cases, and understand ethical considerations in data science.
- **Machine Learning with Python - June, 2024** - Study machine learning fundamentals, including regression, classification, and clustering methods. Gain practical experience with Python libraries and complete a final project to showcase your skills.
- **Data Visualization with Python - June, 2024** - Implement data visualization techniques with libraries such as Matplotlib and Plotly, build interactive dashboards, and apply skills through hands-on projects.
- **Data Analysis with Python - May, 2024** - Develop skills in data cleaning, exploratory data analysis, and visualization. Build and evaluate ML models, and create efficient data pipelines.
- **Databases and SQL for Data Science with Python - May, 2024** - Learn SQL from basics to advanced, integrate with Python, and work with real-world datasets. Explore relational and cloud databases.
- **Data Science Methodology - April, 2024** - Apply CRISP-DM methodology to structure projects, prepare data, build and evaluate models, and understand iterative improvements.
- **Python Project for Data Science - April, 2024** - Extract and analyze stock data using Python, build dashboards to visualize trends, and demonstrate proficiency in data analysis projects.
- **Python for Data Science, AI & Development - April, 2024** - Learn Python basics, data structures, Pandas, Numpy, web scraping, REST APIs, and data collection methods.
- **Tools for Data Science - April, 2024** - Explore tools for data management, integration, visualization, model building, and deployment. Learn about popular open-source and cloud-based tools.
- **What is Data Science? - April, 2024** - Understand data science fundamentals, career paths, big data processing, ETL, and data pipelines. Gain insights into data science applications and cloud computing.

⋆ AI Terminology & Strategy
⋆ Machine Learning Workflows

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

https://www.coursera.org/account/accomplishments/verify/E9QHLH2A529C

- Provided an overview of AI terminology, strategy, and workflows for machine learning and data science.
- Addressed ethical considerations and societal impacts of AI, including bias and its effects on various sectors.

⋆ Python Basics
⋆ Data Types
⋆ Data visualization
⋆ pundas
⋆ numpy
⋆ seaborn
⋆ matplotlib
⋆ EDA
⋆ SQL
⋆ Statistical Thinking
⋆ Statistical Analysis
⋆ Relational Database
⋆ SQL JOINs
⋆ SQL Aggregation
⋆ Git/ Github
⋆ Command line
⋆ CLI piping

Datacamp

https://www.datacamp.com/portfolio/umermajeed

- Introduction to Python - Completed - 2017
- Intermediate Python - Completed - 2017
- Data Types for Data Science in Python - Completed - 2017
- Python Data Science Toolbox (Part 1) - Completed - 2017
- Python Data Science Toolbox (Part 2) - Completed - 2017
- Statistical Thinking in Python (Part 1) - Completed - 2017
- Statistical Thinking in Python (Part 2) - Completed - 2017
- Introduction to Version Control with Git - Completed - 2018
- Intermediate SQL Queries - Completed - 2017
- Introduction to Shell - Completed - 2018
- Introduction to Data Visualization in Python - Completed - 2017
- Intermediate Data Visualization with Seaborn - Completed - 2018

⋆ Privacy Techniques
⋆ Federated Learning
⋆ Secure Multi-Party Computation
⋆ Differential Privacy
⋆ Remote Execution

Private & Secure AI/Data Science Courses - OpenMined

https://courses.openmined.org/courses

- **Our Privacy Opportunity - Completed - Mar. 2021** - Explore structured transparency, privacy techniques, and the privacy-transparency trade-off.
- **Foundations of Private Computation - Ongoing - Progress 80%** - Implement federated learning, secure multi-party computation, homomorphic encryption, and differential privacy.

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)