Maede Maftouni

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SELECTED WORK EXPERIENCE

Senior Data Scientist, Socure   Oct 2024 – Present
- Developed Databricks dashboards, Streamlit, and Glean apps for vendor performance review, enabling systematic ranking of vendors across multiple countries and assisting engineers in optimizing the waterfall of calling vendors.

Senior Data Scientist, Quantum-Si   May 2022 – Oct 2024
- Developed a machine learning model that predicts laser power for protein sequencing chips with 92% accuracy, surpassing previous models. Implemented an Airflow pipeline for automated predictions and integrated results into a Superset dashboard. This model is now used for all produced chips.
- Designed an interactive Streamlit application for statistical hypothesis testing, providing stakeholders with actionable insights to guide product improvement strategies.
- Engineered and optimized ETL processes using Airflow, significantly cutting manual data processing time and enhancing product development scalability. Automated data extraction using various APIs (e.g., Jira, Asana, SharePoint, and GraphQL) and integrated clean data into Redshift and Superset dashboards, boosting operational efficiency and transparency in R&D and marketing.
- Collaborated on data analysis to enhance kinetic databases and improve protein sequencing accuracy. Designed success metrics and developed dashboards to track sequencing performance.
- Supported trace viewer development by equipping developers with in-depth knowledge of the cloud API and the relationships between traces and their metadata.
- Streamlined data operations by phasing out DBT, reducing query time by 20%, and optimizing pipeline scheduling. These improvements aligned with management's strategy to enhance resource allocation and cut cloud costs.
- Socialized Superset dashboard capabilities and availability of data tailored to users' analysis needs.

Adjunct Professor, University of New Haven   Sep 2023 – Dec 2024
- Conducted a detailed course designed to mentor junior data scientists in data engineering and science skills and tools, encompassing workflow automation with Airflow, data manipulation with SQL, data wrangling and analysis in Python, dashboard creation in Tableau, and VBA programming in Excel.

Graduate Research Assistant, Virginia Tech   Sep 2018 – May 2023
- Designed and implemented two robust COVID-19 CT scan classifiers on our own curated dataset.
- Designed and implemented a deep learning structure for laser melt pool video object segmentation.
- Designed deep learning models, including attention-based models for parameter calibration of dynamical systems.
- Implemented federated learning for the 3D printing process.

Graduate Research Assistant, AmirKabir University of Technology   Sep 2014 – May 2015
- Designed and implemented a type-2 fuzzy expert system for osteomyelitis diagnosis.

SKILLS

- Data Science: Data Analytics, Machine Learning, Deep Learning, Predictive Modeling, Data Visualization.
- Data Engineering: Apache Airflow, Data Modeling, dbt, BigQuery, Amazon Redshift, SQL (Postgres).
- Computer Vision & NLP : Image Classification, Object Detection, LLM Application Development.
- Programming: Python (PySpark, Pandas, Scikit-learn, PyTorch, TensorFlow, etc.), SQL, R, MATLAB, VBA.
- Tools & Technologies: AWS (EC2, Redshift, RDS, S3, etc.), Tableau, Superset, Streamlit, OpenCV, Spark, Primavera.

EDUCATION

Ph.D. in Industrial and Systems Engineering   May 2023
Virginia Tech, Blacksburg, VA, USA   GPA: 4/4

M.Sc. in Industrial and Systems Engineering   May 2020
Virginia Tech, Blacksburg, VA, USA   GPA: 3.97/4

M.Sc. in Industrial and Management Systems Engineering   May 2015
Amirkabir University of Technology (AUT), Tehran, Iran   GPA: 3.91/4

B.Sc. in Industrial and Management Systems Engineering   May 2013
Amirkabir University of Technology (AUT), Tehran, Iran   GPA: 3.82/4

Publications

- **Maede Maftouni**, Bo Shen, Andrew Chung Chee Law, N. Ayubi Yazdi, Zhenyu (James) Kong, ""A mask-guided attention deep learning model for COVID-19 diagnosis based on an integrated CT scan images database." IISE Transactions on Healthcare Systems Engineering 13.2, 2023.

- **Maede Maftouni**, Andrew Chung Chee Law, Bo Shen, Yangze Zhou, N. Ayubi Yazdi, Zhenyu (James) Kong, "A Robust Ensemble-Learning Model for COVID-19 Diagnosis on CT Scan Images," in IIE Annual Conference, 2021.

- Yingqi Lu, **Maede Maftouni**, Tairan Yang, Panni Zheng, David Young, Zhenyu (James) Kong, Zheng Li, "A novel disassembly process of end-of-life lithium-ion batteries enhanced by online sensing and machine learning techniques." Journal of intelligent manufacturing 34.5 2023.

- Liurui Li, **Maede Maftouni**, Zhenyu (James) Kong, Zheng Li, "An Automated Recycling Process of End-of-Life Lithium-Ion Batteries Enhanced by Online Sensing and Machine Learning Techniques," in REWAS, 2022.

- **Maede Maftouni**, M.H. Fazel Zarandi, I.B. Turksen, N. Ayubi Yazdi, "Systematic Bone Infection Detection in Axial Diabetic Foot MRI," in IEEE CIBCB, 2015.

- **Maede Maftouni**, M.H. Fazel Zarandi, I.B. Turksen, Faeze Roshani, "Type-2 Fuzzy Rule-Based Expert System for Ankylosing Spondylitis Diagnosis," NAFIPS, 2015.

- Faeze Roshani, M.H. Fazel Zarandi, I.B. Turksen, **Maede Maftouni**, "Fuzzy Expert System for Prognosis of Breast Cancer Recurrence," NAFIPS, 2015.

Awards and Achievements

- Won the **best paper competition** in the Manufacturing and Design Division of the IISE conference.   May 2022
- Won the **runner-up award** in INFORMS QSR **Data Challenge on COVID-19 CT Diagnosis**.   Nov 2020
- Won the **second place** in the 2020 VT INFORMS student chapter **Poster Competition**.   Nov 2020
- Awarded the **Graduate Fellowship** for the Ph.D. program at Virginia Tech.   Apr 2017
- Awarded the **honorary admission to M.Sc.** in Industrial Engineering at AUT.   June 2013

Professional Training and Certificates

- Graduate **Certificate in Data Analytics** at Virginia Tech.   May 2020
- One-year higher education course entitled **"Project Engineering"** at Tose'eh Institute.   Apr 2016
- Using Python to Access Web Data - University of Michigan at Coursera.org.   May 2016
- Machine Learning - Stanford University at Coursera.org.   Dec 2015

Teaching Experience

Workshops, Virginia Tech INFORMS Student Chapter   June 2021 – June 2022
- Deep Learning with Python.
- Building Interactive Dashboards with Tableau.
- US Real Estate Market Trends Visualization.
- Data Wrangling and Analysis in Python.

Instructor, Virginia Tech   May 2019 – July 2019
- Taught engineering economy undergraduate course.

Teaching Assistant, Virginia Tech   Sep 2018 – May 2021
- Probability Foundations (Spring 2021), Facilities and Logistics (Fall 2020), Production Planning and Inventory (Spring 2020), Management Systems (Fall 2019), Engineering Economy (Spring 2019), Operations Research (Fall 2018), Deterministic Operations Research (Spring 2018).

Leadership and Activities

- Served as **INFORMS student chapter vice president** at Virginia Tech.   Aug 2020 – May 2021
- Served as the ISE scientific association vice president at Amirkabir University of Technology.   Aug 2010 – May 2011