Siavash Barqi-Janiar

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Summary

I am a **ML Researcher / Data Scientist** with a strong enterprise-level and academic background. My programming skills include **Python, C/C++, R, Matlab**, etc. I also have a solid research background, **5 publications**, and multiple awarded **scholarships**.

Experience

Data Engineer | Docma Jan. 2024 – Present

- Designed an **ETL pipeline** from 0 to 100% including a Command Line Interface (CLI), data preprocessing, alpha-lag-decay process, and exporting the results, predicting future sales attribution.
- **Automated 80%** of data workflows and minimized the need for manual intervention.
- Enabled importing and exporting data from/to four different sources: **local**, **API**, **AWS S3**, and **PostgreSQL (PSQL) database**.
- Implemented distinct **visualization dashboards** using **Plotly** and **Dash** to help board members and senior engineers interactive with for decision making.
- Developed **predictive ML-based algorithms** using **Sci-Kit Learn** to forecast future client sales, leading to a new **$500K contract acquisition** for the company.
- Held **client meetings** to present product updates, address their needs, and ensure their concerns were resolved. Provided the team with updates on next steps required to meet client requests.

Researcher | Mitacs & York University May 2023 – Feb. 2024

- Contributed in ML-based electric vehicles (EV) charging management in smart cities domain by proposing an **evolutionary reinforcement learning (ERL)** algorithm.
- Utilized **TensorFlow** and **PyTorch** for building an **evolutionary calculation** model to minimize EV charging costs based on the city electricity price movements.
- Received recognition for its innovative approach, winning an **$8000** prize for its contribution to sustainable transportation and smart city initiatives.

Research Assistant | York University Sep. 2021 – Apr. 2023

- Proposed a **transfer learning (TL)** method based on **feature extraction** to predict jamming patterns in a communication network. Reduced the time complexity of the primary model by **30 times**.
- Realized a comprehensive **XAI** method comprising **pattern recognition** and **rule learning** for network security. Improved the **transparency** of the model compared to the benchmark explainable models **by 17%**, whilst having a **32% less error rate**.
- Introduced an evaluation environment comparing the performance of **Recurrent Neural Network (RNN) structures** utilizing **Long Short-Term Memory (LSTM)** layers, achieving a **13% higher throughput rate** than **Convolutional Neural Network (CNN) structures** while having **x1.2 fewer parameters**.
- Peer Reviewed and presented multiple research papers throughout the work period.

Research Assistant | Amirkabir University Jan. 2021 – Jun. 2021

- Realized an efficient **model-free reinforcement learning** MAC protocol for frequency resource allocation. Surpassed the benchmark protocol with nearly **60% better throughput**.
- Leveraged an **online actor-critic** algorithm for access problems in heterogeneous networks. Achieved **95% throughput** in the network marked as the **highest possible performance**.
- Optimized the resource allocation system in distributed computer networks with prioritized packets using ML/AI, which increased the throughput of the wireless system **by approximately 15%**.

Publications [Link]

- S. B. Janiar, P. Wang, ”Intelligent Anti-jamming based on Deep Reinforcement Learning and Transfer Learning,” *IEEE Transactions on Vehicular Technology*, 2023.
- Barqi Janiar S, Pourahmadi V, ”Deep-reinforcement learning for fair distributed dynamic spectrum access in priority buffered heterogeneous wireless networks,” *IET Commun. 2021;19*. https://doi.org/10.1049/cmu2.12098
- S. B. Janiar, P. Wang, ”A transfer learning approach based on integrated feature extractor for anti-jamming in wireless networks,” *IEEE PIMRC, Toronto*, 2023.
- S. B. Janiar, Xian Lu, P. Wang, ”Explainable Reinforcement Learning for Wireless Security at the Physical Layer: A Survey,” IEEE Transactions on Wireless Communications, 2022.
- S. B. Janiar and V. Pourahmadi, ”Deep-Reinforcement Learning for Fair Distributed Dynamic Spectrum Access in Wireless Networks,” *2021 IEEE 18th Annual Consumer Communications & Networking Conference (CCNC)*, 2021, pp. 1-4, doi: 10.1109/CCNC49032.2021.9369536.
- S. B. Janiar, A. Eckford, ”The Theory and Applications of Coded Modulation in Digital Communications: A Survey”, *York University*, Dec. 2021.

Projects [Link]

RAG based chatbot: [https://siaschatbot.streamlit.app/]

- Developed a **RAG-based web app** capable of retrieving information from any website, and answering questions based on the website information.
- Used **Langchain** and **OpenAI’s GPT-3.5 LLM model** for the implementation.

Spam Email Detector:

- Prompt engineered the **Meta LLAMA 2** model for spam email detection using **LangChain**.
- Wrote a customized prompt code and used **GCP** for GPU-based training and evaluation.

MNIST Handwritten Digits

- Designed and implemented a supervised learning algorithm to classify handwritten digits using the **MNIST dataset**, achieving high accuracy in prediction.
- Optimized model performance by **fine-tuning** hyperparameters, applying feature engineering techniques, and utilizing **regularization** methods to reduce overfitting.
- Developed and trained the model using **Keras** and **TensorFlow**, leveraging a **CNN** for improved digit recognition.

Education

York University | MS Electrical Engineering and Computer Science — 2023
Field of Study: AI and Machine Learning — GPA: 3.8 / 4.0

Amirkabir University | BS Electrical Engineering — 2021
Focus: Telecom Engineering, AI, and Machine Learning — GPA: 3.4 / 4.0

Skills

- **Programming Languages:** Python, SQL, C/C++, Java, R, HTML, JavaScript, C#.
- **LLM / ML Frameworks:** Sci-kit Learn, PyTorch, Tensorflow, Keras, LLAMA, LangChain, HuggingFace, Chroma, Spark MLib.
- **ML Techniques:** Supervised Learning, Unsupervised Learning, Deep-Reinforcement Learning
- **Cloud Tools:** AWS, Docker, Google Compute Engine, Google Cloud Storage.
- **API and Visualization Tools:** Streamlit, Kivy, Matplotlib, Git, LaTeX, Qt Design.
