Mariana Khachatryan, PhD

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Data Scientist with experience in developing and deploying end-to-end machine learning pipelines. Skilled in predictive modeling, quantitative analysis, data visualizations of big data using Python, SQL and C++. I am a trained Data Scientist from The Erdös Institute and a nanodegree holder of Udemy for Deep Learning and Artificial Intelligence.

Skills

- **Languages** & **Tools**: SQL, Python(Libraries: Numpy, SciPy, Pandas, Matplotlib, Tensorflow, Scikit-learn), Microsoft Power BI (view reports), C/C++, Git, Shell, Latex.
- **Machine Learning** & **AI**: Deep Learning (CNNs, LSTMs, Autoencoders, Transformers), NLP, Supervised & Unsupervised Learning, Statistical Modeling, Time Series Forecasting, LLM Fine Tuning, OpenAI API, Langchain, Building Chatbot, Prompt Engineering.

Experience

- **Erdös Institute Data Science Bootcamp** — Columbus, OH
  Data Science Fellow — *Sep. 2024 - Dec. 2024*
  - Led a team of PhD researchers in building machine learning models for predicting car price and identifying key features driving model prediction using SHAP values, achieving R^2 of 0.88.
  - Communicated findings to stakeholders (CarMax, Upstart); built reproducible codebase in Python with Git.

- **Florida International University (FIU)** — Miami, FL
  Postdoctoral Research Associate — *Jan. 2020 - May 2023*
  - Used Python, probability and statistics for exploratory data analysis, data engineering and model development for large scale particle physics data from GlueX experiment at Jefferson Lab.
  - Used Least Squares and Maximum Likelihood statistical methods to clean data via Probabilistic Event Weightings. Implemented multivariate classification algorithms in C++ to classify particles. Applied bootstrapping techniques for error estimation. Collaborated with a global team of 300+ scientists to exchange findings, refine data analysis strategies, and improve model accuracy.
  - Participated in collection, monitoring and quality check of big data.
  - Mentored junior group members. Delivered presentations for technical and non-technical audiences. 40+ publications in peer reviewed journals. Recognized with a Certificate of Appreciation from Executive Dean.

- **Old Dominion University** — Norfolk, VA
  Research Assistant — *Jan. 2014 - 2019*
  - Utilized MS SQL to process the Jefferson Lab CLAS collaboration (over 200 physicists) large scale data. Used C++ for Monte Carlo simulations, error estimation and prediction of Electron-beam energy reconstruction. Mentored junior researchers. Received recognition and award. Data analysis results published in Nature journal. 3 media appearances (ODU1, ODU2, JLab).

Selected Machine learning and Deep learning Projects

- **Car sales price prediction Nov. 2024 GitHub URL**: Predicted car sales price based on various features.
- **Clothing Sales Forecasting Jun. 2025 GitHub URL**: Developed time series forecasting models using LSTM networks and Linear Regression to predict clothing sales trends.
- **Large Language Model (LLM) fine tuning, July 2025 GitHub URL**: Fine tuning model from OpenAI API and serving it with FastAPI.

Recognition & Awards

- **Certificate of Appreciation**: Florida International University Executive Dean (2021)
- **Research Excellence**: Jefferson Science Associates Graduate Fellowship (2018-2019)
- **1st Place Prize**: Jefferson Lab Users Organization Poster Competition (2018)

Education

Ph.D. in Experimental Nuclear Physics, Old Dominion University	2019
M.Sc. in Physics, Old Dominion University	2014
M.Sc. in Physics, Yerevan State University	2011-2013
B.Sc. in Physics, Yerevan State University	2007-2011

[0]Languages: **English** (Fluent), **Russian** (Fluent), **Armenian** (Native)