

# MILAD SHIRAZI

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Check out [www.milad-shirazi.ml](http://www.milad-shirazi.ml) for my accomplishments and feel free to ask my AI assistant about me there.

## SUMMARY

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Data Scientist and Machine-Learning Engineer who is passionate about machine-learning applications and staying up-to-date with latest technology advancements with over 5 years of experience in design, development, deployment, maintaining, monitoring, and scaling data and AI pipelines as well as collaborating with various technical and non-technical teams and individuals.

Hands-on Experience in:

- Design, Development and Deployment of Machine Learning pipelines on cloud and on-premise platforms
- Time Series data & forecasting using customized state-of-the-art models
- Natural Learning Processing (NLP), LLMs fine-tuning and prompt engineering
- Creating dashboards for monitoring and providing reports and documentations
- Analysis and prediction of signal-processing data

Familiarity with Recommender systems (content-based, Item/user-based, collaborative filtering), Reinforcement Learning, Computer Vision and Image Processing, and Data Engineering and Software Engineering common practices.

## WORK EXPERIENCE

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### Senior Data Scientist / Machine Learning Engineer – Remote

*Aug 2021 – Present*



**RIGID ROBOTICS:** An advanced Mining technology group based in Vancouver, British Columbia, Canada that provides AI software as a service for optimized solutions

#### **Batch High-Precision State Detection** - Deployed on Azure Cloud services:

- Design, Development and Deployment of a complete AI integrated system that corrects the real-time pipeline outputs by allowing the delayed pipeline to see the ahead signals, leading to a 5% increase in overall accuracy (90 to 95%). This pipeline had a separate stream for recovered signals, and was implemented with the following Azure cloud services: ML workspace, Function App, Event-Hubs, CosmosDB, Azure Data Explorer (ADX), Service-Bus, and SignalR
- Design and Implementation of the Azure orchestrator with Dagster and FastAPI scheduling
- Writing Tests for the Machine Learning deployment pipeline while monitoring with Power BI dashboards

#### **Real-Time High-Precision State Detection** - Deployed on Azure Cloud services and on-premise:

- Design, Development, and Deployment of two complete Real-Time Machine-Learning state detection Pipelines that consist of various preprocessing steps, an auto-encoder model and 2 Attention based models all stacked on top of each other, resulting in an 8% F1 score accuracy improvement (from 82% to 90%)
- Deploying the Developed pipeline using Tensorflow-Lite and Numpy for optimized latency and achieving an inference speed of 0.0005 second (half a millisecond) for each record (on a single core CPU device with a batch size of 1)

#### **Other modules and achievements:**

- Design and Development of a machine learning pipeline that detects the Digging Condition Index(DCI) which indicates the softness/hardness of the digs performed by the shovel, using high frequency acceleration data
- Fine-tuning a pre-trained Large Language Model with billions of parameters on the entire company's documentation for technical and non-technical teams and deployed it on Azure services
- Development and Deployment of a Chat-Bot trained on company's internal data, utilizing prompting methods such as Chain-Of-Thought, One and Few-Shot Learning in order to achieve tasks like creating tables based on dates and non-technical summarizations.
- Design, Development and Deployment of a machine learning pipeline that detects Boom-Jacks and high-tension digs in a shovel/excavator
- Development of Center-Detection pipeline that locates shovel's center based on coordinate signal behavior
- Clustering excavator's movements and data augmentation using Variational-AutoEncoders (VAEs)
- Creating separate customized accuracy metrics for stakeholders and clients, as well as the technical team



**Yaas Arghavani Industrial Engineering:** A financial IT consulting group based in Tehran, Iran that provides solutions and services in Online Banking and Payment using software and AI

**Predicting Bank's total monthly deposits:**

- Using RNNs & Transformer models to predict Mellat Banks' total deposits for the next month
- Data mining & Feature engineering on big data using different tools such as Spark (Koalas-PySpark and Scala) & Dask
- Parallel/multithreaded programming in python to reduce feature engineering runtime from 14 days to 4 hours
- Reporting to clients and stakeholders and providing guidance for project end goals
- Utilizing Federated Learning in order to train a single model without needing direct access to client data.

**ATM machine allocation across the country:**

- Recommending optimized locations to place new ATM machines using machine learning and Data Analytics
- Extracting features (neighborhood safety, wealth, Population Density, etc.) based on Customer Transactions
- Applying Recurrent Neural Networks in order to remove noise data and outliers (97% successful)
- Utilizing Applied mathematics and Algebra to develop customized machine learning models (derived from DBscan, KNN, collaborative filtering) to find the locations of rival banks' ATM machines with a 97% accuracy

**Churn prediction for Mellat Bank Mobile App users:**

- Predicting Customer RFM using Classic models, LSTMs & Attention-Based-Models (Transformers) and providing benchmarks and Predicting churn rate with an overall accuracy of 98%
- Customer segmentation based on user transaction behavior
- Extracting features and utilizing time-embedding (Periodic & non-periodic), wavelet transform and other signal processing techniques (Fourier Transforms) on time-series data

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**EDUCATION****UNIVERSITY OF TEHRAN – Tehran, Iran****2017-2020**

Master of Science - Civil and Environmental Engineering

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**TECHNICAL SKILLS AND TOOLS****Programming Languages:** Python, SQL, KQL, Scala, C++, Q**Data Engineering tools:** Power BI, SSIS, Microsoft SQL Management Studio, PostgreSQL (relational), MongoDB (non-relational), Spark (Koalas-PySpark and Scala), Dask, ORMs (SQLAlchemy)**Software practices and tools:** RESTful APIs such as FastAPI, Flask, Django, Version control systems (Git), Object Oriented Programming, Linters, and some familiarity with CI/CD pipelines**AI and Machine Learning Tools:** Pandas, Numpy, Scipy, Jupyter, Plotly, Tableau, Tensorflow, Keras, Pytorch, Scikit-learn, EvalML & MLlib, AutoML, Huggingface, Torch, OpenAI, RAG, and other GPT tools**Cloud Services:** Azure Cloud services such as ML workspace, Function App, Event Hubs, CosmosDB, Azure Data Explorer (ADX), Service Bus, Dagster, and SignalR, as well as familiarity with some Google cloud services.**Machine Learning Models:**

- Classic Supervised (Linear and Logistic Regressions, SVMs, Naive Bayes, Decision Trees) & Unsupervised (K-means, PCA, DBscan, One-class-SVM) models, and Ensemble methods such as Boosting (Gradient Boosting models such as XGBoost) and Bagging (such as Random Forest)
- Neural Networks (Feed Forward, Recurrent Neural Networks, Convolutional Neural Networks, VAEs, Auto-Encoders, Attention Based models)
- Pre-trained Large Language Models in Natural Language Processing