Mansour **Saffar M.**

Machine Learning Engineer - Graduate Research Assistant

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Education

2016 - 2019 **M.Sc (thesis-based) in Computer Science (GPA: 4/4)** University of Alberta, Edmonton
- Expected graduation date: March 2019
- Highlights: Worked on **deep learning** and **NLP** for dialogue generation systems
- Relevant Coursework: **Reinforcement Learning**, **Deep Learning**, **Machine Learning**, Data Mining
- Supervisor: Prof. Osmar Zaiane
- Thesis: "Self-attentional Models Application for Task-oriented Dialogue Generation Systems"

2011 - 2016 **B.Sc in Electrical Engineering (GPA: 3.67/4)** University of Tehran, Tehran
- Highlights: Applied classical **machine learning** models for MRI image analysis
- Relevant Coursework: **Data Structures and Algorithms**, **Advanced Programming**, **Pattern Recognition**, Introduction to Artificial Intelligence, Linear Algebra
- Supervisor: Prof. Hamid Soltaninan-Zadeh
- Thesis: "Classification and Detection of Epileptic Patients Using Brain MRI Images"

Work Experience

03/18 - Present **Machine Learning Engineer** AltaML, Edmonton
- Designed and helped to develop a **data generation framework** for training **task-oriented chatbots**. This framework enabled us to (1): create **high-quality training data** (covering most of the real-world scenarios) for specific domains which no data was available and (2): develop **multi-domain chatbots**.
- Researched and trained **Natural Language Understanding (NLU)** models for task-oriented chatbots. Given the need for a robust NLU model for our chatbot pipeline, I developed NLU models with high accuracy/F1-score (+93%) for **user intent classification** and **entity extraction**.
- *Technologies: Python, Rasa, ParlAI, spaCy, NLTK, Scikit-learn, MongoDB, Pandas, AWS, Git, Docker*

05/17 - 08/17 **Data Analyst** Finning Canada, Edmonton
- Created regression models for rental machinery residual value prediction using **ensemble methods (Random Forest and GBRT)** with high R^2 (+90%).
- Developed a **recommender system** using **association rule mining** method. Faced with the problem of a large number of records, I augmented the system with specific data structures for speed-up.
- *Technologies: Python, C++, Pandas, Scikit-learn, H2O, XGBoost, LightGBM, Azure ML, MySQL, Microsoft SSMS, Plotly*

Selected Projects

09/17 - 11/18 **Deep Learning Models for Task-oriented Chatbots** Graduate Research Assistant (Master's Thesis)
- Given the success of **self-attentional models** in machine translation, I researched usage of them for task-oriented chatbots. The results showed faster training with comparable accuracy. [Source Code]
- Developed an **evaluation method** for **task-oriented chatbots** using profile-conditioned user simulator. This method can model **user characteristic** and behavior in chatbot evaluation.
- *Technologies: Python, Tensorflow (tensor2tensor), Rasa, Git*

09/16 - 11/16 **Retinal Image Segmentation** Machine Learning Course
- Developed segmentation model by applying **ensemble and SVM models** on retinal images. Faced with the problem of small dataset size, we achieved good results by using bagging methods. [Report Link]
- *Technologies: Python, MATLAB*

04/15 - 04/16 **Classification of Epileptic Patients** Bachelor's Thesis
- Applied **SVM and Kernel SVM models** on statistical and textual information extracted from brain MRIs to detect epileptic patients. [Paper Link]
- *Technologies: Python, MATLAB*

04/15 - 07/15 **Human Fall Detection System** Rehabilitation Systems Course
• Applied **SVM model** and **image processing techniques** on human pose features extracted from videos to detect fall. [Report Link]
• *Technologies: MATLAB, LIBSVM*

Publications

Februray 2019 **Ghazal Sahebzamani, Mansour Saffar, Hamid Soltanian-Zadeh**
• *Machine Learning Based Analysis of Structural MRI for Epilepsy Diagnosis* (In press)
International Conference on Pattern Recognition and Image Analysis (IPRIA 2019) [Paper Link]

Teaching Assistantships

Fall 2017 **Reinforcement Learning in Artificial Intelligence** University of Alberta, Edmonton
• A comprehensive course on reinforcement learning. Besides grading, I collaborated with 10 TAs in the labs to help 250 students with their programming assignments.

Fall 2016 **Introduction to Foundations of Computation** University of Alberta, Edmonton
• An introduction to data structures in Python. I ran weekly labs and taught data structure concepts and Python programming to the students in my lab and held office hours to help them with their assignments.

Technical Skills

Languages **Programming Languages:**
Python (4+ years), C++ & MATLAB (Proficient), Java (Intermediate)

ML/DL Tools **Machine Learning & Deep Learning Libraries:**
Scikit-learn, H2O, Tensorflow, Familiar with Pytorch

Optimization **Numerical Analysis & Optimization Libraries:**
NumPy, SciPy, hyperopt

NLP **Natural Language Processing & Conversational AI Libraries:**
spaCy, NLTK, Gensim, Rasa (Core & NLU), ParlAI

Big Data **Big Data Analysis Frameworks:**
Familiar with Hadoop, Apache Spark (PySpark)

Database **Data Management & Munging:**
MySQL, Pandas, MongoDB, Redis [Udemy Certificate]

Cloud **Cloud Computing Platforms:**
AWS (EC2, S3, Lambda), Microsoft Azure (ML)

Tools **Software Development Tools:**
Git, Docker [Udemy Certificate], AWS CLI

Volunteering

2014 - 2015 **Chief Editor**
• Chief editor of Biotech journal published by University of Tehran student branch of ISBME. I managed 5 students in order to publish a monthly magazine about the latest innovations in biomedical engineering.

Winter 2014 **Event Organizer**
• Helped in organizing the first biomedical engineering technical ideas competition (Ideas Bazaar) with cooperation of Amirkabir University of Technology.