Mansour Saffar

Machine Learning Engineer

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Work Experience

03/18 - Present **Machine Learning Engineer** AltaML, Edmonton

• Developed **NLU** modules (intent recognition and entity detection), **extractive text summarization**, **AdWords generation**, **keyword extraction**, and **OCR** in various NLP projects.
• Developed an automatic **medical report generation** system from technician reports using transformer-based models with 87% similarity with radiologists' writings.
• Developed a **regulatory change management system** using distributed semantic representation models to detect changes between two legal regulatory frameworks with +95% detection accuracy.
• Developed a human-in-the-loop **content-based recommender system** to help content editors find the most relevant articles while using the web CMS with an F-score of 80%.
• Designed and developed a **data generation framework** to create a high-quality and multi-domain dataset for training **task-oriented chatbots**.
• Developed and deployed a pipelined **chatbot** for answering complex natural queries from a financial database.
• Participated in a 5-day internal hackathon organized by a large holding company to develop an **information extraction system** from unstructured insurance documents.
• **Technologies:** *Python, Tensorflow (tensor2tensor), Tf-Serving, PyTorch, Rasa, ParlAI, spaCy, NLTK, Gensim, Scikit-learn, MongoDB, Pandas, Dask, PySpark, AWS, GCP, Azure, Git, DVC, Docker, MLflow*

05/17 - 08/17 **Data Analyst** Finning Canada, Edmonton

• Developed regression models for rental machinery residual value prediction using **ensemble methods (Random Forest and GBRT)** with high R^2 (+90%).
• **Technologies:** *Python, C++, Pandas, Scikit-learn, H2O, XGBoost, LightGBM, Azure ML, MySQL*

Select Projects

03/19 - Present **Ana (Automatic Nursing Agent)** Joint Project with Amii

• Designed the architecture and developed NLU modules for Ana, an intelligent chatbot with emotion capabilities designed to help elderly people. [Mentioned on CBC News]
• **Technologies:** *Python, Rasa NLU, AWS, GCP, Docker, Git*

09/17 - 11/18 **Deep Learning Models for Task-oriented Chatbots** Graduate Research Assistant (Master's Thesis)

• Researched usage of **self-attentional models** for training end-to-end task-oriented chatbots. The results showed faster training with comparable accuracy. [Source Code] [Publication Link]
• Developed **ChatSim**, an **architecture agnostic evaluation framework** for task-oriented chatbots that can model **user characteristics** and behaviour in chatbot evaluation. [Source Code] [Publication Link]
• **Technologies:** *Python, Tensorflow (tensor2tensor), Rasa, spaCy, Git*

09/16 - 11/16 **Retinal Image Segmentation** Machine Learning Course

• Developed a 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*

Education

2016 - 2019 **M.Sc in Computer Science (GPA: 4/4)** University of Alberta, Edmonton

• Relevant Coursework: **Reinforcement Learning**, **Deep Learning**, **Machine Learning**, Data Mining

2011 - 2016 **B.Sc in Electrical Engineering (GPA: 3.67/4)** University of Tehran, Tehran

• Relevant Coursework: **Data Structures and Algorithms**, **Advanced Programming**, **Pattern Recognition**, Introduction to Artificial Intelligence, Linear Algebra

Technical Skills

Languages	**Programming Languages:** *Python (4+ years), C++ & MATLAB (Proficient), Java (familiar)*
ML/DL Tools	**Machine Learning & Deep Learning Libraries:** *Scikit-learn, H2O, PyTorch, Tensorflow (tensor2tensor)*
XAI	**Explainable AI tools and libraries** *LIME, SHAP, What-if tool*
Optimization	**Numerical Analysis & Optimization Libraries:** *NumPy, SciPy, hyperopt*
NLP	**Natural Language Processing & Conversational AI Libraries:** *spaCy, NLTK, Gensim, Rasa (Core & NLU), ParlAI, Transformers*
Big Data	**Big Data Analysis Frameworks:** *Apache Spark (PySpark)*
Database	**Data Management & Munging:** *MySQL, Pandas, Dask, MongoDB, Redis, Neo4j*
Cloud	**Cloud Computing Platforms:** *AWS (EC2, S3, Lambda, SageMaker), Azure (Azure ML, App Service), GCP*
MLOps	**ML Model Deployment and MLOps:** *Docker (2+ years), TF-Serving, MLflow, Streamlit, Flask, FastAPI, Terraform, Kubernetes (familiar)*
Tools	**Software Development Tools:** *Git, DVC, Linux (Ubuntu), Visual Studio Code*

Publications

August 2019 — **Mansour Saffar, Amine Trabelsi, Osmar R. Zaiane**
• *Self-Attentional Models Application in Task-Oriented Dialogue Generation Systems*
Recent Advances in Natural Language Processing (RANLP 2019) [Publication Link]

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

Volunteering

October 2019 — **Public Speaker** — Data Science Meetup, Edmonton
• Presented a talk about **explainable AI (XAI)** and its application in industrial ML. [YouTube Video] [Slides]

October 2020 — **Public Speaker** — Data Science Meetup, Edmonton
• Presented a talk, **From RNNs to GPT-3**, about the progression of deep learning for NLP [Slides]

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.

Certificates

DevOps — **Software engineering and DevOps tools:**
Docker [Udemy], Kubernetes [Udemy], Redis [Udemy], AWS Lambda [Udemy]