# Mansour Saffar

Machine Learning Engineer

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## Work Experience

01/22 - Present **Lead Machine Learning Engineer** AltaML, Toronto
• Serving as ML Solution Architect and QA Lead in multiple machine learning projects.
• Designed the architecture and lead a team of 5 ML devs to build a **customizable object detection solution** built on top of Azure and Kubernetes (AKS).

03/21 - 12/21 **Senior Machine Learning Engineer** AltaML, Toronto
• Lead multiple teams of machine learning engineers (2-3 team members) in multiple projects, including recommender systems and time-series forecasting.
• Designed the architecture and implemented a **machine learning model deployment pipeline** built on top of AWS and Kubernetes (EKS). This pipeline is used internally to deploy ML models.

03/18 - 03/21 **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 multiple task-oriented chatbot projects including **synthetic data generation tool for NLU and dialogue management**, **chatbot to answer complex natural queries from a financial database**, **customer service** and **FAQ chatbots**.
• **Technologies:** *Python, PyTorch, Tensorflow (tensor2tensor), Tf-Serving, Rasa, spaCy, NLTK, Gensim, Scikit-learn, MongoDB, Pandas, Dask, PySpark, AWS, Azure, Git, DVC, Docker, Kubernetes, MLflow*

05/17 - 08/17 **Data Analyst** Finning Canada, Edmonton
• Developed regression models for rental machinery residual value prediction using **ensemble models**.
. • **Technologies:** *Python, C++, Pandas, Scikit-learn, H2O, XGBoost, LightGBM, Azure ML, MySQL*

## Select Projects

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
• With a focus on Machine Learning, Natural Language Processing and Chatbots

2011 - 2016 **B.Sc in Electrical Engineering (GPA: 3.67/4)** University of Tehran, Tehran
• With a focus on Machine Learning and Medical Image Processing

# Technical Skills

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| Languages | **Programming Languages:**<br>*Python (5+ years), C++ and Java (familiar)* |
| ML/DL/XAI | **Machine Learning, Deep Learning, and Explainable AI:**<br>*Scikit-learn, H2O, PyTorch, Tensorflow (familiar), SHAP, What-if tool* |
| NLP | **Natural Language Processing and Conversational AI:**<br>*Transformers, spaCy, NLTK, Gensim, Rasa (Core & NLU), ParlAI, FairSeq, Tensor2tensor* |
| Data | **Big Data Analysis Frameworks and Databases:**<br>*MySQL, Pandas, Dask, MongoDB, Redis, Apache Spark (PySpark)* |
| Cloud | **Cloud Computing Platforms:**<br>*AWS (Certified ML-Speciality, EKS, Lambda, SageMaker), Azure (Azure ML, App Service, AKS)* |
| MLOps | **Machine Learning Model Deployment and MLOps:**<br>*Docker, MLflow, Streamlit, Flask, FastAPI, Terraform, Kubernetes, TF-Serving* |
| Tools | **Numerical Analysis and Software Development Tools:**<br>*Git, DVC, NumPy, SciPy, MATLAB, hyperopt, 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 2020 — **Public Speaker** — Data Science Meetup, Edmonton
• Presented a talk, **From RNNs to GPT-3**, about the progression of deep learning for NLP [Slides]

03/19 - 10/19 — **Machine Learning Engineer in Ana Project** — Joint Project with Amii
• Collaborated with Prof. Zaiane's team in architecture design and developing NLU modules for Ana, an intelligent chatbot with emotional capabilities designed to help older adults. [Mentioned on CBC News]

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

# Certificates

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| Machine Learning | **Machine learning certifications:**<br>AWS Certified Machine Learning - Specialty [Certification], |
| Software & DevOps | **Software engineering and DevOps certifications:**<br>Docker [Udemy], Kubernetes [Udemy], Redis [Udemy], AWS Lambda [Udemy] |