

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

Publications

August 2019	Mansour Saffar, Amine Trabelsi, Osmar R. Zaiane • <i>Self-Attentional Models Application in Task-Oriented Dialogue Generation Systems</i> Recent Advances in Natural Language Processing (RANLP 2019) [Publication Link]
February 2019	Ghazal Sahebzamani, Mansour Saffar, Hamid Soltanian-Zadeh • <i>Machine Learning Based Analysis of Structural MRI for Epilepsy Diagnosis</i> International Conference on Pattern Recognition and Image Analysis (IPRIA 2019) [Publication Link]

Volunteering

October 2019	Public Speaker • Presented a talk about explainable AI (XAI) and its application in industrial ML. [YouTube Video] [Slides]	Data Science Meetup, Edmonton
October 2020	Public Speaker • Presented a talk, From RNNs to GPT-3 , about the progression of deep learning for NLP [Slides]	Data Science Meetup, Edmonton

Teaching Assistantships

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

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