Behdad (Ben) Ehsani

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Education

- **M.Sc. in Data Science** — Montréal, Canada
  HEC Montréal – 3.88/4.3 – Top 10% – Winner of six awards (34,000 $) — *Sep 2021–April 2023*
- **M.Sc. in Operations Research and Optimization** — Tehran, Iran
  University of Tehran – Merit-based admission – Dropped out — *Sep 2020–Jul 2021*
- **B.Sc. in Industrial Engineering** — Tehran, Iran
  K.N. Toosi University – 3.84/4 – Top 5% — *Sep 2016–Jul 2020*

Experience

- **Research Fellow in Applied Machine Learning** — Montréal, Canada
  Chair in Energy Sector Management, HEC Montréal & MILA — *Jul 2022 - Apr 2023*
  - Applied **time-series forecasting** models, statistical, machine learning, and deep learning models, sourced from academic papers, for forecasting electricity price and demand, using **Python–PyTorch**.
  - Gathered data from multiple sources, such as weather, demand, and price, and carried out the ETL process.
  - Assessed the impacts of exogenous variables on the forecasting result (**Feature Engineering**) and conducted statistical tests in **R** to illustrate significant differences between forecasts.
  - Developed a novel deep learning model, improving forecasting errors by **43%** compared to the forecast provided by the Ontario Electricity System Operator (IESO).
  - **Supervisors**: Prof. Pierre-Olivier Pineau, Prof. Laurent Charlin

- **Research Fellow in Logistics and Optimization** — Tehran, Iran
  Supply Chain Lab, University of Tehran — *Jan 2020–Jul 2021*
  - Proposed **decision-making frameworks** for the ordering, allocation, and storage of vaccines, and identified locations for facilities during the pandemic.
  - Built mathematical models to address **real-life health-care problems**, solved using meta-heuristic algorithms and the commercial solver (GAMS) to find optimal solutions.
  - Accounted for uncertainty in COVID-19 problems using Fuzzy Mathematical Programming (FMP).
  - **Supervisors**: Dr. Fariba Goodarzian, Prof. Masoud Rabbani

Journal Publications (*List of Publications on Google Scholar*)

- "Price Forecasting in the Ontario Electricity Market via TriConvGRU Hybrid Model: Univariate vs. Multivariate Frameworks", *Under Review at* ***Energy Economics***, 2023.
- "Designing Humanitarian Logistics Network for Managing Epidemic Outbreaks in Disasters Using IoT", ***Computers & Industrial Engineering***, 2023.
- "Designing a Vaccine Supply Chain Network Using IoT: AI-based Solutions", ***Annals of Operations Research***, 2022.
- "A Supplier Selection Method Using Integrated Fuzzy DEMATEL–ANP–DEA Approach (case study: Petroleum Industry)", ***Environment, Development and Sustainability***, 2022.

Selected Projects (*List of Projects on Github*)

- (**Regression – Forecasting**) Electricity Load Forecasting for Toronto, CA with DL Models (**LSTM, GRU, 1D-CNN, 2D-CNN, FCN, TCN, ResNet, CNN-LSTM, LSTM-Attention, Transformers, and Auto-Encoder**) and Hyper-Parameter Tuning by **Bayesian Optimization** (*Github*).
- (**Classification**) A Comprehensive Explanatory Data Analysis (EDA) and Modelling Credit Risk with Machine Learning Models (**XGBoost, KNN, Random Forest, Naïve Bayes, Logistic Regression**) in **R** to Detect Good and Bad Loaners (*Github*).
- (**Classification – Clustering**) Customer Churn Prediction in the Banking Industry Using the Unsupervised **K-Means** Clustering technique to Group Customers, **Supervised ML** Models to Find Churners, and **SMOTHE** Oversampling Technique to Balance Classes, Implemented in **Python** (*Github*).
- (**Classification – Model deployment**) An ECG Heartbeat Classification Project with 98% Accuracy, including EDA, Feature Engineering, Data Modelling with **CNN**, Hyper-parameter Tuning with **MLFLow**, and Model Deployment with **Flask** and **Docker** (*Code upon the request*)

- (**Data Engineering**) An Automated Real-time File Downloader and Storage System in **AWS S3** Bucket with **AWS Lambda** Function (*Github*).
- (**NLP**) A Comprehensive **Python Package** with **22** Functions for **Text** and **Tweet Preprocessing and Cleaning** (*Github*).
- (**Classification – NLP**) **Pipelined** Hate Speech Classification of Tweets (hate speech, not-hate speech, and neutral) with Fine-tuned **Transformer** Models (**BERT**, **DistilBERT**, **RoBERTa**) (*Github*).

Computer Skills

Programming: Python, R, SQL (MySQL, MS SQL), MATLAB, C++, LaTeX

AWS Cloud Platform: S3, EC2, IAM, SageMaker, QuickSight, Glue, Athena, EMR, Redshift

IDE: PyCharm, Cloud9

Libraries: Pytorch, Keras, Tensorflow, NLTK, spaCy, Hugging Face, PySpark, MLlib, Scikit-learn, Pandas, Numpy, Matplotlib, Seaborn, Plotly, MLFlow

Big Data: Apache Spark, Hadoop

Others: Git, Flask, Docker, MS Power BI, Tableau, MS Office

Soft Skills: Technical Writing, Conveying Technical Solutions to Non-technical Managers, Teamwork, Active Listener

Certificates

- Natural Language Processing (NLP) in Python
- Deployment of NLP Models in Production
- SQL - MySQL for Data Analytics and Business
- AWS Machine Learning Specialty (Exam Preparation)