

Ebrahim Pichka

M.A.Sc. Student/Research Assistant

Windsor, Ontario, Canada

pichka@uwindsor.ca

[Personal Website](#) • [GitHub](#) • [Medium](#)

EDUCATION

University of Windsor

M.A.Sc. • Industrial Engineering

- **CGPA:** 4.0/4.0
- **Supervisor:** Dr. Guoqing Zhang

Windsor, ON, Canada

Jan. 2023 – Present

Amirkabir University of Technology (Tehran Polytechnic)

B.Sc. • Industrial Engineering

- **CGPA:** 3.2/4.0
- **Thesis:** Algorithmic Trading in Financial Markets using Deep Reinforcement Learning Algorithms.
- **Supervisor:** Dr. Masoud Mahootchi

Tehran, Iran

Sept. 2017 – Dec. 2022

RESEARCH INTERESTS

- Graph Representation Learning & Geometric Deep Learning.
- Deep Reinforcement Learning & Sequential Decision-making.
- Mathematical Optimization & Operations Research.
- Learning to Optimize & Decision-focused Learning.
- Meta Learning and Multi-task learning.

SELECTED PROJECTS

Re-implementations

- **“Graph Attention Networks”** (Veličković et. al., 2017): Implemented the Graph Attention Network architecture for graph representation learning and node classification task using the PyTorch framework. [\[GitHub\]](#)
- **“Attention Is All You Need”** (Vaswani et. al., 2017): Implemented the Transformer encoder-decoder architecture for sequence-to-sequence modeling completely with PyTorch [\[GitHub\]](#)
- **“Learning Heuristics for the TSP by Policy Gradient”** (Deudon et. al., 2018): Developed, tested, and experimented on a PyTorch implementation of an attention-based Policy Gradient agent for learning to solve Travelling Salesperson Problem. [\[GitHub\]](#)
- **“Continuous control with deep reinforcement learning”** (Lillicrap et. al., 2015): An implementation of the Deep Deterministic Policy Gradient (DDPG) algorithm using the Pytorch framework. [\[GitHub\]](#)

Machine Learning Projects

- **Knowledge Distillation in Neural Networks:** Distilled a trained ResNet50 model into a ResNet18 on CIFAR10 dataset. And compared results with ResNet18 when trained from scratch and the fine-tuned pre-trained ResNet50 itself. [\[GitHub\]](#)
- **Deep Convolutional Autoencoder:** Implemented deep convolutional autoencoder for image noise reduction and dimensionality reduction using Pytorch framework. [\[GitHub\]](#)
- **Options Pricing with Machine Learning:** Applied three different machine learning methods, namely LightGBM, Multi-layer Perceptron, and Support Vector Machine to estimate the market price of option contracts and compared their performance to that of the Black-Scholes model as a baseline. [\[GitHub\]](#)

SKILLS

- **Programming Languages:** Python, Julia, C++, MATLAB
- **Frameworks:**
 - **ML:** PyTorch, JAX, TensorFlow, Keras, PyTorch-Geometric, Ray, TorchRL, Scikit-learn
 - **Optimization:** Gurobipy, Pyomo, CVXOpt, PuLP
- **Software:** Linux, Git, Docker, MongoDB

EXPERIENCE

- Machine Learning Intern** • Astyage Apr. 2021 – Sep. 2021 • Tehran, Iran
- Contributed to a team collaboration in researching and developing an intent-based conversational chat-bot assistant system for enterprise customer support management using TensorFlow and transformer-based natural language understanding models.
- Data Science Intern** • Dayche Data Mining Group Jan. 2021 – Apr. 2021 • Tehran, Iran
- Contributed to developing an end-to-end market segmentation system using unsupervised learning methods based on user transactions in a team of interns in python.

TEACHING EXPERIENCE

- Teaching Assistant**
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|-------------------------------|------------------------------------|-------------|
| - Operations Research I | University of Windsor | Fall 2023 |
| - Production Analysis | University of Windsor | Summer 2023 |
| - Numerical Analysis | University of Windsor | Winter 2023 |
| - Fuzzy Intelligent Systems | University of Tehran | Fall 2021 |
| - Statistical Quality Control | Amirkabir University of Technology | Fall 2021 |
| - Corporate Finance | Amirkabir University of Technology | Spring 2020 |

TEST SCORES

GRE (Graduate Record Examinations) General: Oct. 2021

- Quant: 169/170	- Verbal: 153/170	- Analytical Writing: 3.5/6
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IELTS (International English Language Testing System) Academic: (band score of 9) June 2021

Overall: 8	Reading: 9	Listening: 8.5	Writing: 7	Speaking: 7
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CERTIFICATES

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|-----------------------------------------|---------------------------------------|
| - Deep Learning Specialization | Coursera (DeepLearning.ai) |
| - Reinforcement Learning Specialization | Coursera (University of Alberta/AMII) |
| - TensorFlow Developer | Coursera (DeepLearning.ai) |
| - Machine Learning | Coursera (Stanford Online) |
| - Machine Learning Fundamentals | DataCamp |
| - Deep Learning | DataCamp |

SELECTED COURSEWORK

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| - Computational Intelligence (A) | - Artificial Intelligence (A+) |
| - Data & Information Analysis (A+) | - Optimization I (A+) |
| (Statistical Learning) | (Operations Research) |
| - Principles of Simulation (A+) | - Optimization II (A) |

OTHER

Technical Blogging: Wrote in-depth technical posts on different topics in machine learning and optimization algorithms.

Open Source: Contributed to development of open-source projects such as Pytorch, Pytorch-geometric, etc.