

# Faraz Khadivpour

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## SUMMARY

I am a Machine Learning Researcher and Data Scientist with over 3 years of hands-on experience in developing and deploying advanced ML models. My expertise spans working with image and sequential data, leveraging cutting-edge explainable AI techniques to interpret convolutional neural networks (CNNs) and large language models (LLMs).

## WORK EXPERIENCE

- **Machine Learning Intern** Jan 2022 - Dec 2022  
*Scotiabank* Edmonton, AB
  - Collaborated with computer science researchers to apply **explainable AI** method to an ML model.
  - Worked on an explainable machine learning method on credit reports and time series data.
- **Machine Learning Researcher** May 2020 - Dec 2021  
*Alberta Machine Intelligence Institute (Amii)* Edmonton, AB
  - Proposed a novel explainable AI method that makes neural networks more understandable to human users. (Responsibility)
  - Analyzed the inner workings of the neural networks using **Keras** and **TensorFlow** frameworks.
  - Applied our proposed method on image classification tasks.
  - Worked on state-of-the-art convolutional neural networks such as **ResNet**, **AlexNet**, and **VGG**.
  - Designed a human subject study to evaluate our proposed method and analyzed the results using **Rstudio**.
- **Machine Learning Developer** Jan 2020 - May 2020  
*Neuromuscular Control & Biomechanics Laboratory (NCBLab)* Edmonton, AB
  - Worked as a team member on a project for **RWDI** consulting firm.
  - Implemented Python scripts to extract features from 3D building models in Rhinoceros software.
  - Applied data preprocessing and used different dimensionality reduction methods such as **PCA** and **autoencoders**.
  - Designed and developed highly accurate ML models using **Pytorch** to predict a specific variable in wind tunnels.

## RESEARCH EXPERIENCE

- **Graduate Research Assistant** May 2023 - Ongoing  
*Computing Science Department, University of Alberta.* Edmonton, AB
  - Applying our proposed explainable AI method to **Large Language Models (GPT-2)**.
  - Implementing an approach to enhance human understanding when fine-tuning by the **LoRA** (Low-Rank Adaptation of Large Language Models) method.

## TEACHING EXPERIENCE

- **Graduate Teaching Assistant, Game AI** Jan 2023 - Apr 2023  
*Computing Science Department, University of Alberta.* Edmonton, AB
  - Conducting tutorials and review sessions to reinforce key concepts and help students with assignments.
  - Grading quizzes and providing feedback to students to help improve their understanding of the material.
  - Coursework was in **C#** with **Unity**.

## EDUCATION

- **M.Sc. in Computing Science** Jan 2023 - Expected Dec 2024  
*University of Alberta* Edmonton, AB  
GPA: 4.0
- **M.Sc. in Environmental Engineering**, University of Tehran Sep 2015 - Feb 2018
- **B.Sc. in Civil Engineering**, K.N.Toosi University of Technology Sep 2010 - Aug 2015

## CERTIFICATES

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- **MLOps** Coursera Specialization by deeplearning.ai *Summer 2022*
- **Machine Learning Technician Certification** Amii *Fall 2020*
- **Deep Learning** Coursera Specialization by deeplearning.ai *Summer 2020*

## PUBLICATIONS

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- [1] Responsibility: An Example-based Explainable AI approach via Training Process Inspection (Submitted to an IEEE journal 2023) DOI: [arXiv:2209.03433v1](https://arxiv.org/abs/2209.03433v1)
- [2] Khadivpour F, Guzdial M. Explainability via Responsibility. The 2020 Intelligence and Interactive Digital Entertainment (AIIDE) Workshop on Experimental AI in Games (EXAG). DOI: [arXiv:2010.01676](https://arxiv.org/abs/2010.01676).
- [3] Shayesteh AA, Koohshekan O, Khadivpour F, Kian M, Ghasemzadeh R, Pazoki M. Industrial waste management using the rapid impact assessment matrix method for an industrial park. Global Journal of Environmental Science and Management. 2020 Apr 1;6(2):261-74. DOI: [10.22034/GJESM.2020.02.10](https://doi.org/10.22034/GJESM.2020.02.10)

## SKILLS

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- **Programming Languages:** Python, R, SQL, C#
- **Machine Learning Frameworks:** Tensorflow, Pytorch, Keras, Tflearn, Sklearn, PyCaret
- **Data Manipulation Tools:** Pandas, Numpy
- **Data Visualization Libraries:** Matplotlib, Plotly, Seaborn
- **Deep Learning:** CNN, RNN, LLM, Autoencoders
- **Cloud Platforms:** AWS, Google Cloud
- **Model Deployment:** Docker, Kubernetes
- **Web Technologies:** Flask, Django, HTML, Streamlit