

Zahra Gharaee

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[Portfolio](#)

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SUMMARY

- 7+ years of experience in cross-functional teams, leading cross-industry projects across diverse machine learning domains.
- Demonstrated successful leadership and management in multiple projects, achieving notable outcomes.
- Expertise in building, debugging, and deploying resilient machine learning and deep learning models.
- Developed scalable data solutions using TensorFlow and PyTorch, prioritizing usability and feasibility.
- Released several datasets and code repositories, and published papers at prestigious venues such as NeurIPS and ICML.

WORK EXPERIENCE

Research Associate | University of Waterloo | Canada

11/2024 – 06/2025

- Developed parameter-efficient fine-tuning for LLMs using LoRA, aligning models with human preferences through reinforcement learning from human feedback (RLHF).
- Applied parameter-efficient fine-tuning to vision-language models for image classification tasks.
- Created a Hugging Face-compatible loader for the 5M-image multimodal dataset, with support for resolution variants and standard ML splits.
- Mentored a project focused on applying Swin Transformers to superpixels for efficient salient object detection.
- Led the BIOSCAN-5M initiative, including dataset release, benchmarking, and development of machine learning tasks such as classification, zero-shot clustering, and multimodal retrieval.
- Released a public code repository and published research in NeurIPS 2024.

Research Fellow | University of Waterloo | Canada

02/2022 – 11/2024

- Releasing and Benchmarking Multimodal Dataset for ML Applications
 - Led BIOSCAN-1M project involving data structures, data solutions, data migration, and data governance.
 - Released large-scale datasets on multiple platforms (e.g., GoogleDrive, Zenodo, Kaggle and Hugging Face).
 - Benchmarked image classification against baselines (ResNet50 and Transformers) by leveraging transfer learning.
 - Fine-tuned ViT backbone models and achieved over 90% accuracy (Micro-F1, Macro-F1) on large-scale datasets.
 - Released a public code repository, and Published an article in NeurIPS 2023.
- Causality in collaboration with the Dept. ECE University of Waterloo
 - Mentored project on generative causal inference, which enhanced domain generalization about 8.8%.
 - Published article in ICML 2023.

Postdoc | Linköping University | Sweden

09/2018 – 02/2022

- Autonomous driving project in collaboration with WASP and SCANIA
 - Managed projects on road network graph learning and reinforcement learning for autonomous driving.
 - Developed, debugged, and executed ML experiments in cloud, parallel computing, and bash environments.
 - Enhanced graph representation learning for unsupervised transductive by 2% and supervised inductive by 10%.
 - Collected, curated, and released geospatial data from OpenStreetMap (OSMnx) for 18 Swedish cities.
 - Released two code repositories, and published articles in Pattern Recognition 2021 and ICPR 2021.
- Managed project on object's 3D shape estimation.
 - Developed and implemented predictive models for self-supervised 3D shape estimation.
 - Enhanced Mean-IoU about 8%, and reduced 3D-Angular-Error about 5° for the CUB dataset.

SKILLS

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|---------------------------------|-------------------------------|------------------------|
| • Detail Oriented | • Computer Science | • Pandas . Pyspark |
| • Teamwork Skills | • Machine learning Algorithms | • Scikit-learn |
| • Research and Development | • Big Data Analysis | • DevOps . MLOPs |
| • Project Leadership | • Cloud Computing | • Docker . Singularity |
| • Project Management Skills | • LLMs . NLP | • Python . C/C++ |
| • Strong Problem-Solving Skills | • GCP . AWS | • Git |

EDUCATION

Ph.D. in Cognitive Science | Lund University | Lund, Sweden

- Thesis: Human action recognition by unsupervised learning (e.g., self-organizing maps and growing grid neural networks).

M.Sc. in Mechatronics | K.N. Toosi U of Tech | Tehran, Iran | GPA: 4

- Thesis: Attention control learning of a robotic agent in decision space by reinforcement learning.

B.Sc. in Electrical Engineering | K.N. Toosi U of Tech | Tehran, Iran | GPA: 4

- Thesis: Design and implementation of a MIMO controller for a quad system.

CERTIFICATES

Generative AI with Large Language Models

04/2025

Credential issued by DeepLearning.AI and Amazon Web Services via Coursera

- Gain foundational knowledge, practical skills, and a functional understanding of how generative AI works
- Dive into the latest research on Gen AI to understand how companies are creating value with cutting-edge technology
- Instruction from expert AWS AI practitioners who actively build and deploy AI in business use-cases today