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LinkedIn Profile

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GitHub

Medium

# EBRAHIM MOUSAVI
**Curriculum Vitae**

## Summary

Ambitious AI developer with a Master's degree in Information Technology, specializing in Deep Learning, Computer Vision, and Natural Language Processing. Experienced in designing and deploying advanced machine learning models. Proven track record of publishing in peer-reviewed journals and mentoring others in AI. Keen to drive innovative projects in a cutting-edge LLM research and development environment.

## Education

- **Master of Science in Information Technology**
  Sep 2018 - Sep 2021
- Thesis title: Designing a fashion recommendation system based on the similarity between clothes and analyzing users' sentiment analysis.
- Tarbiat Modares University, Tehran, Iran
    - Supervisor: prof. Gholam Ali Montazer
- **Bachelor of Software Engineering**
  Sep 2009 – Feb 2015
- Thesis title: Implementation of a pyramid security system with firewall for computer networks

## Research Interests

- **Large Language Models (LLM)**
- **Natural Language Processing (NLP)**
- **Computer Vision**

## Career Experience

Aug 2024 – Now

- Freelance Machine Learning and Deep Learning Instructor
    - Offer personalized online courses and mentorship in machine learning and deep learning for various skill levels.
    - Create hands-on projects and coding exercises to enhance practical skills and real-world application.
    - Stay current with AI advancements to keep the curriculum relevant and impactful.
    - My goal is to equip learners with the skills needed to excel in the rapidly evolving field of artificial intelligence.

Feb 2024 – Aug 2024

- AI Team Lead at Resana (in partnership with Rutelia Company, **Japan**)
    - Developed and led the implementation of Defective Image Generative AI, an innovative AI technology designed to learn from product image data and generate numerous good/defective product images
    - Leveraged diffusion models to generate defective product images from a minimal dataset, thereby improving system accuracy
    - Collaborated with Rutelia Company in Japan to integrate and deploy advanced AI solutions in manufacturing environments.

Sep 2023 – Feb 2024

- Senior Deep Learning Developer / AIHomeDesign in Vancouver, **Canada** (Tehran's office)
    - **Item Removal (IR)** project aims to mask desired regions in images in a realistic way in order to remove unnecessary objects from images.
    - **Image Enhancement (IE)** project includes two sides **1)** Enhancement **2)** Reconstruction with **InstructPix2Pix**
    - **Virtual Staging (VS)**, utilizing computer-generated images to enhance real estate properties by digitally furnishing and decorating
    - **Interior Design (ID)**, employing innovative techniques to transform spaces into visually appealing and functional environments
    - **Day to Dusk (D2D)** with InstructPix2Pix: transformations, enhancing interior design projects by digitally simulating the transition from daytime to twilight settings, adding ambiance, warmth, and a captivating atmosphere to spaces.
    - **Segmentation and Detection**: Implemented state-of-the-art models (OneFormer, SAM, SegGPT, and Conditional DETR) for various segmentation and detection tasks.
    - **Pruning Techniques for Diffusion Models**: Enhancing Efficiency and Performance

- **Image-to-Image Search:** Integrated CLIP and Faiss library for efficient image-to-image search capabilities.
- **Service Deployment**: Deployed and managed services using TorchServe.

Apr 2022 – Aug 2023
**Deep Learning Freelancer**

| Chest cancer classification images with PyTorch and EfficientNet ([Github](#)) | Language Modeling with PyTorch ([Github](#)) |
|---|---|
| Facial Age Estimation with PyTorch ([Github](#)) | Using Vision Transformer for blood cancer detection ([Github](#)) |

Jan 2021 – Mar 2022
- Deep Learning Researcher and Developer / Baharan company in Tehran, Iran.
    - Implementing three computer vision projects which include Face detection, Object detection and Optical Character Recognition (OCR)
    - Fine-tune BERT Model for Sentiment classification

# Publications

- Pourmirzaei, M., Montazer G.A., **Moosavi, E**. "[ATTENDEE: an AffecTive Tutoring system based on facial EmotioN recognition and heaD posE Estimation to personalize e-learning environment](#)". (**Accepted** in International Journal of Computers in Education) **(Q1, IF 6.1, SJR 1.442)**

- Beygi, M., Fallahi, M., Vali, R., **Mousavi, E.**, Lie, J., Saberian, M.. "[FELA-DNN framework to predict the seismic bearing capacity of skirted strip footing placed on a non-cohesive slope](#)". (**Accepted** in International Journal of Soil Dynamics and Earthquake Engineering) **(Q1, IF 4.25, SJR 1.426)**

- Pourmirzaei, M., Montazer G.A., Esmaili, F., **Mousavi, E**., Karamizadeh, S.. "[How Self-Supervised Learning Can be Used for Fine-Grained Head Pose Estimation?](#)".

- **Mousavi E.**, Montazer G.A., Pourmirzaei M., "Designing a fashion recommendation system based on the similarity between clothes and analyzing users' preferences". (Accepted in CSICC2022)

# Teaching and Research Experience

May 2024 – Present
**Research Assistant**
**Laboratory of Systems Biology and Bioinformatics**, University of Tehran
Supervised by [Prof. Ali Masoudi-Nejad](#), contributing to projects at the intersection of systems biology and artificial intelligence.

March 2020 – Present
**Research Assistant and Teaching Assistant**, Tarbiat Modares University, Tehran, Iran
Supervised by [Prof. Gholam Ali Montazer](#)

- Machine learning and Neural Networks (Five semesters)
    - Assisted in both theoretical and practical components of the Machine Learning course.
    - Developed and maintained course-related code repositories on [GitHub](#)
    - Authored multiple blog posts on advanced machine learning topics on [Medium](#)
    - Implemented machine learning algorithms.
    - Prepared test questions and graded assignments (e.g., homework, quizzes, lab reports).

# Technical Skills
## Machine Learning

- Key Machine learning Tasks and Algorithms
    - Regression, Logistic Regression, Classification, Clustering, K-NN, Decision Trees & Random Forests
    - Ensemble Learning
        - Bagging and boosting techniques
        - Boosting models: AdaBoost, Gradient Boost
    - Support Vector Machine (Regression and Classification, Kernel SVM)
    - Dimensionality Reduction (Kernel PCA, LDA, ICA)
    - Experience with Scikit-learn library

## Deep learning

- Experienced with SOTA Computer Vision models & Architectures, Transformers, CNNs
- Experience working on time series data and models (RNN, LSTM, GRU), Graph Neural Networks (GNN)
- Experienced with Self-supervised & Multi-task learning for fine-grained classification tasks
- Experienced with MLOPS

**Computer Vision**

- Image
  - Object Recognition, Detection, Segmentation, Pose Estimation, 3D Vision, Text in Computer Vision, OCR

- Video
  - Objects Tracking, Human Action Recognition

**NLP**

- **Proficient in Fine-Tuning and Distilling Language Models**: Experienced in fine-tuning and distilling models like BERT and GPT for various downstream tasks using frameworks such as HuggingFace and PyTorch.
- **Advanced NLP Libraries**: Skilled in using NLP libraries including Torchtext, NLTK, Gensim, and SpaCy for diverse natural language processing applications.
- **Data Pipelining for NLP**: Competent in building and managing data pipelines for NLP tasks utilizing HuggingFace tools.
- **Comprehensive Knowledge of LLMs**: In-depth understanding of large language models (LLMs), including their architectures and components such as transformer models, embeddings, similarity measures, attention mechanisms, and semantic search techniques.
- **Retrieval-Augmented Generation (RAG)**: Expertise in deploying Retrieval-Augmented Generation into production, enhancing retrieval techniques to improve model performance.

**Speech & Audio**

- Audio Classification, Speech Recognition
- Familiar with general audio processing techniques and concepts such as discrete Fourier transform (DFT), Short-Time Fourier Transform (STFT), Spectrogram, melSpectrogram

**Generative Models**

- Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs)
- Transformer-based Models (GPT, BERT)
- Diffusion Models (Diffusers library, ControlNet, InstructPix2Pix, Stable Diffusion, SDXL)

**Programming and Data Analysis**

- Python, Numpy, Matplotlib, Pandas, Scikit-learn, OpenCV

**Software Development and Deployment**

- PyTorch, TensorFlow/Keras
- Linux (LPIC1: Linux System Architecture, Installation and Package Management, GNU and Unix Commands, Devices, Linux Filesystems, Shells, Administrative Tasks and Essential System Services, Networking Fundamentals)
- Git, FastAPI, MinIO, Gradio, Docker (Containerization, Dockerfile, Docker Compose, Docker Volumes)
- TorchServe (Model Deployment, Model Management, Request Processing, Monitoring and Scaling)

## Selected Courses

- Machine learning
- Computer Vision
- Linear algebra
- Deep Learning
- NLP
- Probability and Statistics

## Languages

- Persian: Native
- English: Professional
- Turkish: Intermediate

## References

- Gholam Ali Montazer (Professor of Information Technology at Tarbiat Modares University)
  - **Email**: Montazer@modares.ac.ir
  - **Phone**: +989123230540
  - **Google** Scholar

- Ali Masoudi-Nejad (Professor of Biology and Bioinformatics at University of Tehran)
  - **Email**: Amasoudin@ut.ac.ir
  - **Phone**: +989125851148
  - **Google** Scholar