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EBRAHIM MOUSAVI

Curriculum Vitae

Summary

Ambitious PhD candidate with a Master's degree in Information Technology, specializing in Deep Learning, Computer Vision, and Natural Language Processing. Skilled in developing and deploying sophisticated machine learning models, currently concentrating on bioinformatics applications, including protein language models. Demonstrated success in publishing peer-reviewed research and mentoring in AI. Eager to join a premier research lab to advance innovative work in protein design and bioinformatics.

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
  - Last two semesters' GPA: 3.43/4.0 and 3.52/4.0
- **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**

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).

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

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

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