Parnian Jalali

Graduate Research Assistant in Artificial Intelligence
Isfahan University of Technology, Isfahan, Iran

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SUMMARY

Graduate Research Assistant with a **multidisciplinary background** in **Electrical Engineering** (**Telecommunications, B.Sc**.) and **Computer Engineering** (**Artificial Intelligence, M.Sc.**). **Over 4 years of experience** in designing and developing advanced deep learning techniques, including **graph neural networks**, **large language models**, and **reinforcement learning** methods, as well as **preparing large-scale datasets**. Specialized in **computer vision** and **signal processing**, with proficiency in **Python** (PyTorch, Transformers, OpenCV, Pandas, NumPy), **C++**, and **MATLAB**. Passionate about leveraging **AI in healthcare** to create meaningful impact and **improve quality of life**.

EDUCATION

M.S. In Computer Engineering (Artificial Intelligence and Robotics) Sep 2020 – Aug 2023
Isfahan University of Technology Isfahan, Iran

- GPA: 4.00/4.00 (17.91/20)
- Graduated among the top 3 students in the class
- Thesis: Learning Brain Network Representation Using a Hierarchical Graph-Based Model
- Thesis Grade: Excellent

B.S. In Electrical Engineering (Telecommunication) Sep 2014 – July 2019
University of Isfahan Isfahan, Iran

- Project Title: ECG-Based Heartbeat Classification for Arrhythmia Detection

RESEARCH INTERESTS

- **AI for Healthcare & mHealth:** Developing ML/DL models to predict and prevent diseases, improve chronic disease management, and enhance patient quality of life using mobile devices and wearable technologies.
- **Interpretable & Trustworthy AI:** Designing methods that make AI decision-making clear and reliable so that clinicians and patients can use them with confidence.
- **Biomedical Signal and Image Processing:** Working with signals (e.g., ECG, EEG) and medical images (e.g., MRI, CT) to extract features and develop ML models for real-time monitoring, diagnosis, and deeper understanding of medical conditions.
- **Large Language Models (LLMs) & Multi-modal Learning:** Experienced in dataset creation (collection, annotation, and curation) and fine-tuning pretrained LLMs for NLP tasks such as sentiment analysis. Interested in extending this expertise to multi-modal medical applications by integrating text, images, and signals for deeper understanding of complex conditions.

RESEARCH EXPERIENCE

Research Assistant
AIDIA Lab, University of Isfahan, Iran Nov 2025 — Present

- Working on generative AI models, including GANs, VAEs, Diffusion Models, and Diffusion Transformers (DiT), for biomarker detection in medical imaging.
- Investigating how generative models can support biomarker discovery and characterization, beyond conventional image enhancement and reconstruction.
- Collaborating on the design and writing of a review paper on generative models in medical imaging.

Research Assistant
Isfahan University of Technology, Iran Sep 2021 — Aug 2023

- Conducted research on spatio-temporal methods for brain-network representation learning.
- Designed and implemented deep learning models for classifying brain disorders using fMRI data.
- Evaluated models on ABIDE and ADHD datasets, achieving performance improvements over state-of-the-art methods.
- First author on a research paper in brain disorder classification.

Teaching Assistant
Isfahan University of Technology, Iran Feb 2022 — Jun 2022

- Assisted in teaching and supporting Reinforcement Learning coursework.
- Graded assignments and projects, and conducted problem-solving sessions for graduate students.

Natural Language Processing Researcher
Isfahan University of Technology, Iran Sep 2021 — Sep 2022

- Collected, labeled, and curated datasets for sentiment analysis tasks.
- Fine-tuned pretrained LLMs (e.g., BERT, DeBERTa, mT5), gaining hands-on experience in dataset creation, model adaptation, and evaluation.
- Co-authored an academic paper on NLP and sentiment analysis.

PUBLICATIONS 🎓Google Scholar

Journal paper

- Safayani, M., Sartipi, A., Ahmadi, **Jalali, P**., AH., Mansouri, AH., Bishe, A., Pourbahman, z., 2024. OPSD: an Offensive Persian Social media Dataset and its baseline evaluations *Under review in* ***New Review of Hypermedia and Multimedia Journal***
  Keywords: Natural language processing, Text classification, Pre-trained language model, Offensive language detection
- **Jalali, P**. and Safayani, M., 2023. HDGL: A Hierarchical Dynamic Graph Representation Learning Model for Brain Disorder Classification.
  Under review in ***Biomedical Signal Processing and Control Journal***
  Keywords: Graph classification, Dynamic functional connectivity, Graph representation learning, Spatial-temporal modeling

ACADEMIC PROJECTS

- **Domain-Adapted Radiology Vision–Language Model :**
  Fine-tuned Llama 3.2 11B Vision for radiology image–text understanding using parameter-efficient adaptation and domain-focused prompting.
- **Vision–Language Grounding for Referring Expressions:**
  Fine-tuned PaliGemma2 on RefCOCO to localize objects from natural-language descriptions with IoU-based evaluation.
- **Math-to-LaTeX Visual OCR :**
  Fine-tuned Gemma 3 Vision to transcribe math expression images into LaTeX with accuracy-oriented evaluation and formatting constraints.
- **Video-to-Text Multimodal Understanding:**
  Implemented frame sampling + multimodal prompting with Qwen2.5-VL for temporal summarization, event understanding, and OCR-in-video.
- **Compute-Efficient Multimodal Fine-Tuning Pipeline:**
  Built a reproducible SFT workflow for Granite Vision enabling rapid, low-compute experimentation with LoRA adapters.
- **Low-VRAM Vision–Language Object Detection:**
  Deployed Qwen2.5-VL with 4-bit quantization for object detection/spatial reasoning under GPU memory constraints.

PROGRAMMING & SOFTWARE

- Python (OpenCV, Pandas, PyTorch, NumPy, Scikit-learn, Hugging Face)
- MATLAB, C++, LaTeX, Git

LANGUAGE SKILLS

TOEFL (Academic): Overall: 98
Listening: 28 — Reading: 23 —Speaking: 22 — Writing: 25
Test date: May 2024

REFERENCES

Reza Rasti
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