Mohammad Eshratabadi

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Research Interests

- Machine Learning
- Deep Learning
- Computer Vision
- Natural Language Processing
- Multi-Modal Models
- Explainable AI and Trustworthy ML

Education

Bachelor of Science in Computer Engineering **Sep. 2020 – Present (2025 Expected)**
Amirkabir University of Technology (Tehran Polytechnic) *Tehran, Iran*

- GPA: **18.57**/20 (3.94/4.00)
- Thesis: *Automated Financial Chart Interpretation Using Multimodal Large Language Models*
  - *Under the supervision of Dr. Ahmad Nickabadi*
- **Relevant Coursework (All "A" Grades):**
  - Principles of Computational Intelligence (20/20)
  - Information Retrieval (20/20)
  - Data Structures and Algorithms (19.5/20)
  - Applied Linear Algebra (19.4/20)
  - Data Mining (18.7/20)
  - Algorithm Design (18.25/20)
  - Principles and Applications of AI (17/20)
  - Engineering Statistics (20/20)

High School Diploma in Mathematics and Physics **Sep. 2017 – Jun. 2020**
National Organization for the Development of Exceptional Talents *Karaj, Iran*

- GPA: **19.55**/20 (4.00/4.00)

Publications

A. Fakhrzdaeh, A. H. Seddighi, **M. Eshratabadi** and A. Esfandyari, "**Text Recognition in Printed Persian Documents Based on Recurrent Neural Networks**", In *Iranian Journal of Information Processing and Management*, In Press, 2025. Link

Research Experience

Research Assistant **Feb. 2025 – Present**
Amirkabir University of Technology, Computer Engineering Department *Tehran, Iran*
Under the supervision of Dr. Ahmad Nickabadi

- Automated Financial Chart Interpretation Using Multimodal Large Language Models (Thesis Project).
- Collected and organized a test dataset consisting of annotated financial chart images (including drawn indicators, handwritten notes and visual cues) paired with corresponding textual analyses authored by the annotators.

Research Assistant **Feb. 2024 – Jan. 2025**
Iranian Research Institute for Information Science & Technology (IranDoc) *Tehran, Iran*
Under the supervision of Dr. Azadeh Fakhrzadeh

- Fine-tuned Tesseract and EncoderDecoder models (ViT + ParsBert) on custom Persian dataset.
- Conducted error analysis on test documents, identifying low-performance areas and producing reports on error patterns.
- Generated and normalized a 2 million text-line dataset from a 45k word-list in 4 fonts for training.
- Created test sets of Persian text-lines, used to evaluate model performance using CER and WER metrics.
- Contributed to writing a research paper, including sections on methodology, used metrics and model architecture.

Language Skills

English: IELTS Academic 8 *(Reading: 9, Listening: 8, Speaking: 7.5, Writing: 7.5)* (Taken: 24/8/2024)
Persian: Native

Skills

Programming Languages: Python, Java, C, SQL, HTML/CSS, JavaScript
Libraries & Frameworks: PyTorch, Tensorflow, Scikit-learn, Pandas, NumPy, Matplotlib, MLFlow, Spring Boot
Tools: Git, Docker, SQL Database (MySQL), LaTeX, Postman, Kubernetes, Google Colab, Flask

Teaching Experience

Teaching Assistant **Fall 2020 – Present**
Amirkabir University of Technology *Tehran, Iran*

- **Principles of Computational Intelligence**: Fall 2024 & 2025, Spring 2025, Instructor: Dr. Mohammad Mehdi Ebadzadeh
- **Principles & Applications of Artificial Intelligence**: Spring 2025, Instructor: Dr. Mahdi Javanmardi
- **Software Testing**: Fall 2025, Instructor: Dr. Faezeh Gohari
- **Software Engineerig II**: Spring 2025, Instructor: Dr. Faezeh Gohari
- **Computer Networks**: Spring 2025, Instructor: Dr. Masoud Sabaei
- **Operating Systems – Lab Instruction Revision Team**: Spring–Summer 2024, Contributed to rewriting the syllabus, under the supervision of Dr. Hamid R. Zarandi
- **Research and Technical Presentation**: Spring 2024, Instructor: Dr. Hamed Farbeh
- **Applied Linear Algebra**: Fall 2023, Instructor: Dr. Ehsan Nazerfard

Projects

Informal Persian Text to Formal Persian *Informal to Formal (GitHub)*

- Implemented seq2seq deep learning models (LSTM & Transformer) with character, word and subword level tokenization to convert informal Persian text into formal Persian.
- Achieved best results with Transformer models (Char-level: CER 15.44%, WER 26.11%), covering data preprocessing, model training and evaluation.

Persian Information Retrieval System *Information Retrieval (GitHub)*

- Developed a TF-IDF search engine for Persian documents using positional indexing, cosine similarity and champion lists.
- Implemented end-to-end text processing including normalization, tokenization, stop-word removal and ranked retrieval.

Pacman-AI: Intelligent Agents for Search and RL *Pacman-AI (GitHub)*

- Built AI agents using search algorithms, adversarial decision-making, reinforcement learning and probabilistic inference in a grid-world environment.
- Implemented custom heuristics, Minimax/Expectimax agents, Q-learning and HMMs to handle partial observability and ghost tracking.

MyTorch: Minimal Deep Learning Library from Scratch *MyTorch (GitHub)*

- Implemented an educational PyTorch-like library in NumPy with core modules for tensors, autograd, layers (FC, Conv2D), activations, loss functions and SGD.
- Trained MLP and CNN models on MNIST achieving over 93% test accuracy using only the framework.

Work Experience

R&D Artificial Intelligence Intern (CO-OP) **Jul. 2023 – Feb. 2024**
R&I (Research and Innovation) center at CROUSE PJS *Tehran, Iran*

- Conducted focused research on Lane Detection task, by doing a comprehensive analysis of over 20 public lane detection datasets, with findings presented to the team and directly informing the team's approach to creating a custom dataset.
- Contributed to team's internal framework enhancement for model training and generating inference results by integrating new models with different backbones and datasets. Utilized MLFlow as a ML OPs tool for experiment tracking.

Java Backend Intern (CO-OP) **Feb. 2022 – Sep. 2022**
Tosan (Banking and Payment Solutions Provider) *Tehran, Iran*

- Developed microservices aimed at modernizing a core project by creating RESTful APIs and applying Test Driven Development (TDD) methodologies.
- Produced project documentation outlining some of the current system functionalities.

Honors & Awards

- Ranked 470 (top 0.3%) among 135,000+ participants of the Nationwide University Entrance Exam (Konkour) in Mathematics and Physics.
- Passed the first stage of Iran's National Olympiad in both Mathematics Olympiad and Informatics (Computer) Olympiad.

References

Available upon request.