Ehsan Mokhtari

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About Me

I am a **Junior AI Engineer** with over **1 year of experience**, currently pursuing a Master's in Data Science at Sapienza University of Rome, with a strong background in my Bachelor's of Computer Engineering. I mostly work on **Machine Learning**, **Neural Networks**, **RAG**, and both **Predictive and Generative Modeling**. I have extensive experience implementing AI in diverse domains, with projects focused on **designing and optimizing end-to-end Vector and Graph RAG pipelines**, **LLM fine-tuning**, **Computer Vision**, **NLP**, **GenAI** and **Diffusion Models**. Combining collaborative problem-solving with end-to-end system design, I aim to build scalable AI solutions for complex real-world challenges.

Work Experience

Data Science & AI Intern - Master Thesis

ENEL Group [visit website]

06/2025 – 12/2025 • Rome, Italy

- Developed the "Optimised KGI-Retriever," an industry-grade, embedding-free Graph RAG retriever that increased retrieval performance by 22% (Recall) and 31% (Precision) by addressing key LlamaIndex constraints and connectivity bottlenecks in LLM-constructed KGIs. Furthermore, I implemented a robust, open-source pipeline for end-to-end Vector and Graph RAG. This project established deep technical proficiency in RAG benchmarking, evaluation, practical graph theory, vLLM, and LLM optimization.

Software Engineer Intern

Rural Cooperatives Organization of Iran [visit website]

10/2020 – 12/2020 • Iran

- Developed and optimized software solutions using Java and Python, integrating database management systems for improved workflow efficiency. Administered computer networks and hardware infrastructure, resolving critical technical issues to ensure system stability.

Education

M.Sc Data Science

Sapienza University of Rome [visit website]

10/2023 – Current • Rome, Italy

- **Courses:** Advanced Machine Learning • Neural Networks • Computer Vision • Statistical Learning • Advanced Data Mining And Language Technology • Cloud Computing (AWS)

B.Sc Computer Engineering

University of Tabriz [visit website]

2017 – 2021 • Tabriz, Iran

- **Courses:** Advanced Programming • Algorithms Design • AI and Expert Systems • Robotics • Database
- **Thesis :** Color Image Encryption Algorithm Based on Three-Dimensional Chaotic Economic Map

Technical Skills

- **AI & Data Science:** PyTorch • Keras • TensorFlow • Scikit-learn • LlamaIndex • vLLM • Ollama • Hugging Face • Neo4j • PostgreSQL • Pandas • NumPy • OpenCV • Matplotlib • Seaborn
- **Cloud, MLOps & Infrastructure:** Docker • AWS (EC2, S3, Lambda) • Google Cloud Platform (Vertex AI) • MLOps (MLflow) • Git • Linux • Windows • Microsoft office/teams • CI/CD (GitHub Actions)
- **Programming & Development:** Python • C • C++ • SQL • MATLAB • R • FastAPI • Pydantic

Interpersonal Skills

- Teamwork & Individual Work • Strong communication and collaboration skills • Problem-solving • Leadership • Flexibility • High Responsibility • Critical Thinking

Language Skills

- **Languages:** Azerbaijani (Native) • Persian (Native) • English (C1) • Italian (A2)

Publications

Color Image Encryption Algorithm Based on Three-Dimensional Chaotic Economic Map [publication link]
Dr. Mohammad Asadpour, Ehsan Mokhtari
5th Int. Conf. on Applied Research in Computer, Electrical and IT - Georgia • **2020**

Projects

Diffusion Based Generative Age Estimation with Conformal Prediction (University Project) [GitHub Link]
02/2025 – 06/2025
- Built a text-conditioned diffusion model trained on the UTKFace dataset to generate realistic face images based on age, gender, and ethnicity prompts. Evaluated the consistency of synthetic outputs by testing whether a conformal prediction-based age estimator produced calibrated intervals that captured the target ages.

Linear Diffusion Models for Generative Image Synthesis (University Project) [GitHub Link]
05/2025 – 07/2025
- Built an interpretable linear non-neural diffusion model for MNIST using PCA and regression. Optimized with nonlinear encoders and cosine scheduling, validating robustness via conformal prediction.

Virtual Piano Using Hand Gesture Recognition (University Project) [GitHub Link]
12/2024 – 01/2025
- Engineered a real-time virtual piano using MediaPipe Hands and computer vision. Optimized finger tracking accuracy, computational speed, and real-time note playback using MIDI integration.

Graph Neural Networks for Road Safety Modeling (University Project) [GitHub Link]
10/2024 – 12/2024
- Developed a spatial-temporal GNN for accident prediction, integrating novel road slope features. Optimized the pipeline to achieve an improved ROC-AUC of 83.22%

Bioinformatics and ML: Disease Gene Identification and Drug Repurposing for HBP (Uni. Project) [GitHub Link]
11/2024 – 01/2025
- Utilized bioinformatics and network medicine to identify HBP-related genes and repurpose existing drugs. Built a disease interactome using PPI and GDA data, applied ML algorithms for gene prediction, and conducted enrichment analysis. Identified 100 putative genes and validated drug candidates using clinical trial data.

Certificates and Courses

- Associate Data Scientist with Python [DataCamp - View Certificate]
- Machine Learning Scientist with Python [DataCamp - View Certificate]
- Introduction to Transformer-Based Natural Language Processing [NVIDIA DeepLearning Institute - View Certificate]
- Advanced Deep Learning with Keras [DataCamp - View Certificate]
- Deep Learning with PyTorch [DataCamp - View Certificate]
- Data Analysis and Visualization with Python [DataCamp - View Certificate]
- Image Processing with Keras and OpenCV [DataCamp - View Certificate]
- Advanced SQL for Data Science [LinkedLearning - View Certificate]
- Scientific Computing with Python [FreeCodeCamp - View Certificate]
- Essential Math and Applied Algorithms for ML [LinkedLearning - View Certificate]
- Feature Engineering for NLP in Python [DataCamp - View Certificate]
- Leading and Working in Teams [LinkedLearning - View Certificate]
- Workplace Health and Safety Training - Low Risk (HS.215.0) [ENEL Group]
- Generative AI Explained [NVIDIA DeepLearning Institute]
- Introduction to LLMs and Prompt Engineering [SoloLearn]

Training Camps and Competitions

BESTech'24 Rome Competition - 2024
- Developed a ChatGPT-based assistant for the BESTech'24 competition, focused on occupational law. The chatbot answered legal queries and analyzed work contracts, helping users access relevant legal information easily.

Sapienza-KPMG Forecasting 2024 - Training Camp - 2024
- Competed in Sapienza-KPMG Forecasting 2024, applying ML and Time-Fold Cross Validation to accurately model seasonality and forecast 4-month sales volume.

dock3-The Startup Lab 7th Edition - 2024
- Participated in dock3's Startup Lab, designing a skill-based job matching platform. Gained hands-on experience in product pivoting, lean startup methodology, and agile team collaboration.