Safoura Banihashemi

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Profile

AI Engineer & Machine Learning Specialist with experience in Agentic Workflows and Natural Language Processing. Proven experience in architecting a multi-agent system using the CAMEL framework to mitigate social bias in LLMs through reflective reasoning. Skilled in developing end-to-end ML pipelines, from graph-based network analysis of 7,700+ research papers to legal text augmentation.

EDUCATION

M.Sc. Artificial Intelligence Sept 2023 – Current
University of Bologna, Italy

B.Sc. Mathematics and Applications Sept 2018 – Aug 2022
Ferdowsi University of Mashhad, Iran

SKILLS

Languages: Persian (Native), English (Proficient), Italian (Elementary)

Libraries & Frameworks: NumPy, Pandas, Scikit-learn, TensorFlow, CAMEL-AI, Matplotlib, Seaborn

ML & AI: LLMs, Prompt Engineering, AI Agents, Transformers, CNNs, Word Embeddings

Programming & Tools: Python, SQL, PostgreSQL, Git, Jupyter, Google Colab, Excel

PROJECT

Mitigate bias Completed: Sep 2025

- Implemented multi-agent collaboration framework (Reasoning & Critic agents) using CAMEL-AI and Gemini 2.5 Flash to reduce biased responses at inference time without the need for costly re-training.
- Enhanced reasoning transparency by implementing a "think tool" for step-by-step reflection, evaluating performance across nine social dimensions on the BBQ Bias Benchmark to achieve high accuracy in ambiguous contexts.

Legal Text Augmentation for Downstream Tasks Completed: Jul 2025

- Developed legal text augmentation techniques using **WordNet+GloVe** embeddings and **agent-based LLMs**, improving class balance in the Demosthenes dataset.
- Expanded underrepresented categories (e.g., Princ + 25%, Aut + 62%, Class + 48%, Conc + 100%), creating a more balanced dataset for the legal text classification.

Brain Tumor Segmentation Completed: May 2025

- Built a **U-Net CNN** for brain tumor segmentation on the BraTS 2020 dataset (with 368 patients).
- Improved performance with a custom loss function (cross-entropy + Dice) and achieved **76.1%** Dice coefficient and **81.5%** IoU on the test set.

Graph Analysis Completed: Feb 2025

- Built and analyzed a graph of **7,791** AI research papers (Hugging Face Daily Papers, 2023–2025) to uncover collaboration patterns between authors, organizations and research communities.
- Discovered a **heavy-tailed** research network where a few key papers, authors, and organizations (e.g., Google, Tsinghua University) dominate collaborations, while most nodes remain sparsely connected.