Soroush Esfahanian

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Summary

Final-year Computer Engineering student at the University of Tehran and research intern at EPFL, with experience in LLM distillation and benchmarking LLM cognitive abilities. Research interests center on understanding and improving model reasoning, including how pretraining and post-training shape its underlying mechanisms and influence reasoning reliability.

Research interests: *LLM reasoning, mechanistic interpretability, pretraining and post-training, AI and human cognition*

Education

University of Tehran, Bachelor of Science in Computer Engineering — Sep 2022 – Feb 2027 (expected)
GPA: **18.97**/*20* · Rank: **4**/*120* — *Tehran, Iran*
Selected coursework: Natural Language Processing; Artificial Intelligence; Engineering Mathematics; Discrete Mathematics.

Publications

[1] A. Zamani*, **S. Esfahanian***, E. Shahabi, M. T. Pilehvar, A. Shakery, Y. Yaghoobzadeh, "PerSo: Investigating Facets of LLMs' Social Intelligence in Real-World Persuasion Scenarios," arXiv preprint arXiv:2610.20548, 2026 (under review). *Equal contribution. [arXiv]

[2] **S. Esfahanian**, K. Rayati, M. Tale Masouleh, "Sound Source Localization in a 3D Multi-Surface Environment Using Learning-Based Methods," in *Proc. 12th RSI Int. Conf. Robotics and Mechatronics (ICRoM)*, IEEE, 2024, pp. 717–724. [DOI] [Code]

Research Experience

EPFL, NLP Lab, Research Intern — Aug 2026 – Present
Supervisor: ***Prof. Antoine Bosselut*** — *Lausanne, Switzerland*

- Conduct a systematic study of transitions in student behavior during distillation across seven training configurations, comparing rollout horizon, prefix source, and KL direction through checkpoint evaluations.
- Identified distinct phases of answer-format alignment, looping escalation, and recovery during training; preliminary comparisons show higher accuracy and earlier recovery with reverse KL than forward KL, alongside persistent looping under off-policy reverse KL.
- Characterized a shift in looping behavior from verbatim repetition toward repeated restarts and self-doubt within the same reasoning approach, distinguishing surface repetition from broader reasoning loops.
- Designed and implemented an importance-weighted distillation objective with geometric-product teacher–student proposals in Verl; evaluated mixture coefficients spanning the on-/off-policy spectrum.

TeIAS (Tehran Institute for Advanced Studies), LLM Lab, Researcher — Jun 2025 – Jul 2026
Supervisors: ***Dr. Mohammad Taher Pilehvar and Dr. Yadollah Yaghoobzadeh*** — *Tehran, Iran*

- Co-developed *PerSo*, a multifaceted benchmark jointly evaluating cognitive and behavioral social intelligence in LLMs within the same real-world persuasion scenarios from Reddit.
- Designed tasks grounded in definitions of cognitive and behavioral social intelligence, pairing belief, emotion, and intent inference with persuasion-response selection; constructed the dataset using an LLM-assisted pipeline and human validation.
- Evaluated 15 model configurations across five families, analyzing scaling and answer-position bias; found that reasoning improved emotion inference in larger Qwen variants but reduced belief-inference accuracy.

University of Tehran, Human and Robot Interaction Lab, Researcher — Jun 2024 – Dec 2024
Supervisor: ***Dr. Mehdi Tale Masouleh*** — *Tehran, Iran*

- Developed a learning-based framework for 3D sound source localization over 20 spatial regions; collected audio at 315 locations in a multi-surface environment. [Code]
- Designed and evaluated four multi-branch architectures based on MLPs and CNNs, fusing audio timing and spectral features.
- Reduced mean localization error from 28.4 to 23.4 cm and runtime from 29.8 to 0.71 seconds with Random Forest region classification, relative to the signal-processing baseline.

Talks

Oral Presentation, 12th RSI Int. Conf. Robotics and Mechatronics (ICRoM) — Dec 2024
Sound Source Localization in a 3D Multi-Surface Environment Using Learning-Based Methods — *Tehran, Iran*

Honors & Funding

Summer@EPFL, EPFL, Competitive, fully funded research internship program — Aug 2026
Rank 16, Iran National Student Olympiad in Computer Science — Jul 2025
Rank 75/*150,000*, Iran National University Entrance Exam (Mathematics & Physics track) — Jun 2022

Teaching Experience

University of Tehran, Teaching Assistant — Feb 2024 – Jun 2026
Tehran, Iran

- Foundations of Data Science, S26: designed and graded an assignment on NLP.
- Programming Languages and Compilers, F25: developed course materials and core project grammar.
- Formal Languages and Automata Theory, F24–S25: designed/graded a recognizability/decidability assignment.
- Engineering Probability and Statistics, S24: designed and graded a probability distributions assignment.

Service

Managing Editor, *Jaryan Quarterly Journal*, IEEE Chapter, University of Tehran — Feb 2024 – Present
Former Member, ACM Chapter, University of Tehran — Sep 2024 – Sep 2025

Selected Course Projects

Natural Language Processing Course Projects [Code] — Jan 2025 – Jul 2025
University of Tehran — *Tehran, Iran*

- Implemented Persian tokenizers, smoothed N-gram models, logistic regression, Naive Bayes, and CBOW/Skip-gram embeddings from scratch, and built a FastText–MLP news classifier.

YouTube Video Category Detection [Code] — Jan 2025 – Jul 2025
University of Tehran — *Tehran, Iran*

- Built an end-to-end SQL-to-model pipeline combining sentence embeddings with engineered engagement features, feeding a multi-branch MLP classifier.

Skills

AI & LLMs	PyTorch, Verl, Transformers, TRL, PEFT, vLLM, DeepSpeed/FSDP
ML & Data	Scikit-learn, NumPy, Pandas, SciPy, Matplotlib
Infrastructure	Linux, Slurm, Docker, Kubernetes, Git, Bash, Weights & Biases
Programming	Python, C/C++, SQL, Go

Languages

English	Advanced, IELTS 8.5/9
French	Elementary, DELF A1 95/100
Persian	Native