Soroush Omranpour

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Selected Industry & Research Experience

Scientist In Residence - LUCID May 2024 – September 2024
Advised by Aaron Labbe *Montreal, Canada*

- Designed and implemented an open-source generative AI pipeline called **Folly** for producing emotionally resonant, audio-synchronized music videos using a Conformer-based speech recognition model, a CNN-based music analysis toolkit, and stable diffusion. Audio synchronization was done by audio-aware interpolations in the VAE latent space.

Machine Learning Researcher - Mila September 2022 – August 2025
Co-advised by Reihaneh Rabbany and Guillaume Rabusseau *Montreal, Canada*

- Developed a scalable and efficient tensor-factorized attention mechanism for high-dimensional tensor structured data, with applications in **timeseries forecasting**, **3D image classification**, and **multimodal stock market prediction** improving SOTA performance on the benchmark datasets and significantly reducing training time and memory footprint.
- Developed an efficient and light-weight **Vision-Language Models** for **Deep Fake Detection** surpassing other VLMs in both accuracy and run-time.

Research Intern - Music AI Lab February 2021 – November 2021
Advised by Yi-Hsuan Yang *Taipei, Taiwan*

- Developed two open-source python packages: **DeepMusic** A library for high level musical data manipulation and preprocessing, supporting common encodings used by sequential models, and **Music-Generation** A PyTorch-based framework for training Transformer models on symbolic music data for conditional or unconditional generation.

Deep Learning Engineer - Fanap Inc. February 2020 – August 2022
Z-Lab *Tehran, Iran*

- Developed a full Persian **Speech Recognition** pipeline including wakeword detection, noise reduction, acoustic modeling (pre-trained Wav2Vec2 finetuned on a collection of open and private speech dataets), and language model-based decoding.
- Designed and deployed a **sematic search engine** leveraging ElasticSearch and a sentence embedding Transformer (a pre-trained Bert finetuned on a collection of private datasets) for commercial information retrieval.

Research Intern - IST Austria June 2019 – September 2019
Advised by Christoph Lampert. *Klosterneuburg, Austria*

- Developed a **VAE-based** neuro-symbolic model for solving Raven Progressive Matrices, aiming to investigate abstract visual reasoning and generalization in neural networks.

Research Intern - DML Lab January 2019 - June 2019
Advised by Hamid R. Rabiee *Tehran, Iran*

- Developed an information-theoretic framework called **SocialPhi** to measure the group performance of popular Github repos' contributors and study its correlation with the popularity of the project.
- Developed a SOTA **RNN-based** method for for early detection of fake news on social media reaching the same accuracy as other baselines in up to 20x fewer timesteps.

Education

McGill University 2022 – 2025
Master of Science in Computer Science, GPA: 3.46/4.00 *Montreal, Canada*

Sharif University of Technology 2016 – 2021
Bachelor of Science in Computer Engineering, GPA: 3.85/4.00 *Tehran, Iran*

Publications

- **Omranpour, S.**, Rabbusseau, G., Rabbany, R. *Kronecker-Structured Attention For Higher Order Transformers*, Under Review
- **Omranpour, S.**, Rabbusseau, G., Rabbany, R. *Higher Order Transformers: Enhancing Stock Movement Prediction on Multimodal Time-Series Data.* Machine Learning in Finance at **KDD 2024**.
- Ramezani, M., Rafiei, M., **Omranpour, S.**, Rabiee, H. *News Labeling as Early as Possible: Real or Fake?*. **ASONAM 2019**.

Skills

Languages: Python, Bash, SQL, JS **Databases**: PostgresSQL, MongoDB **DevOps**: Git/Github, GCP, Docker, SLURM, Unix

ML: PyTorch, HuggingFace Transformers, Pytorch-Lightning, Pytorch-Geometric, Librosa, Nvidia-Nemo, NumPy, Sklearn, PEFT, TRL, Diffusers, Einops, GluonTS, Matplotlib, Pandas

LLM/RAG: Ollama, Llama.cpp, LlamaIndex, LangChain