

Farrin Marouf Sofian

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EDUCATION

University of California, Irvine

PhD. Computer Science

Irvine, CA

9/2023 – 6/2028

- Supported by Chan-Zuckerberg Initiative
- Machine Learning, Deep Generative AI, Game Theory, Probabilistic Models
- GPA: 3.96/4.0

Koç University

B.Sc in Computer Science

Istanbul, Turkey

9/2019 – 6/2023

- Honors: Vehbi Koç Scholar for outstanding academic performance for 4+ semesters.

PUBLICATIONS

Variational Control for Guidance in Diffusion Models

K. Pandey*, **FM. Sofian***, F. Draxler, T. Karaletsos, S. Mandt

INTERNATIONAL CONFERENCE ON MACHINE LEARNING (2025)

<https://arxiv.org/pdf/2502.03686>

Control-Augmented Autoregressive Diffusion for Data Assimilation

P. Srivastava, **FM. Sofian**, F. Immorlano, K. Pandey, S. Mandt

PRE-PRINT (2025)

<https://arxiv.org/pdf/2510.06637>

Parallel Token Generation for Language Models

F. Draxler, J. Will, **FM. Sofian**, T. Karaletsos, S. Mandt

PRE-PRINT (2025)

<https://openreview.net/forum?id=AGJomYSrUG>

SonicDiffusion: Audio-Driven Image Generation and Editing with Pretrained Diffusion Models

BC. Biner, **FM. Sofian**, UB. Karakaş, D. Ceylan, E. Erdem, et al.

ACM TRANSACTIONS ON GRAPHICS (TOG) (2024)

<https://arxiv.org/abs/2405.00878>

GECTurk: Grammatical Error Correction and Detection Dataset for Turkish

A. Kara, **FM. Sofian**, A. Bond, G. G. Sahin

IJCNLP-AACL (2023)

<https://arxiv.org/abs/2309.11346>

* Denotes equal contribution.

WORK & RESEARCH EXPERIENCE

Graduate Researcher at Mandt Lab

University of California, Irvine

2/2024 – Present

Irvine, California

- Working on reward-guided sampling in Diffusion models using optimal-control theory and RL.

Machine Learning Engineer Intern

Adobe

06/2024 – 09/2024

San Jose, California

- Developed and optimized a RAG pipeline for the AI assistant in Adobe Acrobat.
- Reduced input token costs by up to 73 cents per question across various datasets, significantly improving cost efficiency.
- Made the pipeline 9x faster compared to the previous version.

- Worked with SOTA RAG techniques and diverse PDF structures.

Research Assistant at Computer Vision Lab

9/2021 – 12/2023

Koç University & İş Bank Artificial Intelligence Center

Istanbul, Turkey

- Conducted research in Turkey's most competitive AI lab. Worked on sound-guided image manipulation and generation as well as audio identification and re-synthesis projects.
- Leveraged Stable Diffusion while designing and implementing various adapter architectures for efficient audio conditioning.
- Tested multiple image inversion techniques to identify the method that best preserves image identity while facilitating editing.
- Conducted experiments and fine-tuned the framework with audio encoding models including AudioCLIP and CLAP, to assess their performance as audio encoders in the proposed framework.
- Conducted under the supervision of [Dr. Duygu Ceylan](#) and [Prof. Aykut Erdem](#).

Research Assistant at NLP Lab

10/2022 – 7/2023

KUIS AI lab

Istanbul, Turkey

- Created the first high-quality dataset of 130k parallel sentences in Turkish with 25 expert curated writing rules for grammatical error schema.
- Implemented and fine-tuned NMT baseline and sequence tagger model for grammatical error correction and detection.
- Worked with High Performance Computing (HPC) clusters and contributed on writing a [detailed documentation](#) on how to use HPC clusters for graduate students and companies.
- Published in IJCNLP-AACL 2023.

Machine Learning Engineer Intern

6/2022 – 9/2022

RadiusAI

Tempe, Arizona

- Researched and proposed deep learning-based solutions for camera calibration, tailored to the company-specific scene geometry.
- Evaluated the effectiveness of deep learning as well as other traditional methods to solve the problem.
- Optimized the computation of a semantic segmentation scores matrix by nearly 50%, utilizing dynamic programming in the pre-processing step.
- Created the company's first fully automated camera calibration, reducing the company's reliance on expensive annotators.

PROJECTS

Birds of Istanbul App

5/2021 — 7/2022

- Led a group of 4 students and collaborated with a psychology department to create Turkey's first audio-based bird identification mobile application.
- Curated a dataset of 355k bird songs local to Turkey and pre-processed the audio using various models such as Sound Separation proposed by Google.
- Examined several self-supervised transformer-based audio models and fine-tuned them on the dataset.

Audio Re-synthesis and Conversion

1/2022 – 4/2022

- Performed extensive literature study to identify the best suitable model for converting voice of a species into another one.
- Fine-tuned 3 pre-trained encoders, utilizing VQ-VAE and HiFi-GAN as the content encoder and vocoder respectively, on a custom dataset.
- Trained and extracted species' sound embeddings from transformer-based audio encoder model.