Berk Tınaz

tinaz@usc.edu

LinkedIn : http://www.linkedin.com/in/berk-tinaz
GitHub : https://github.com/berktinaz
Website: https://berktinaz.github.io

Summary

Active research experience with transformers and diffusion models for image reconstruction and improving large language models (LLMs) with self-feedback. Looking for research internship positions on reasoning in LLMs or using LLMs in sciences.

Education

- **University of Southern California (USC)** — Los Angeles, CA
  Ph.D. Student in Electrical and Computer Engineering; GPA: 4.00/4.00 — *Aug 2020 – Present*
  Master of Science in Electrical and Computer Engineering; GPA: 4.00/4.00 — *Aug 2020 – Dec 2022*
  Advisor: Prof. Mahdi Soltanolkotabi

- **Bilkent University** — Ankara, TR
  Bachelor of Science in Electrical and Electronics Engineering; GPA: 3.95/4.00 — *Sep 2016 – June 2020*
  Graduation Rank: 5/153

Research Experience

- **AI Foundations for Sciences Center (AIF4S) at USC** — Los Angeles, CA
  Research Assistant. Advisor: Prof. Mahdi Soltanolkotabi — *Jan 2022 - Current*
  - **Large Language Models**: Working on improving LLMs via self-feedback and self-revision loops. Interested in understanding which tasks benefit from self-correcting ability of foundation models. Exploring how synthetic negative samples can be used to improve reasoning capabilities of LLMs.
  - **Inverse Problems**: Worked on sample-adaptive latent diffusion posterior sampling for solving inverse problems, incorporating forward model information into training of diffusion models, accelerating MRI reconstruction via transformer-convolution hybrid architecture.
  - **ML Theory**: Working on global convergence of learning linear target functions with small initialized shallow ReLU networks.

- **Signal Analysis and Interpretation Lab (SAIL) at USC** — Los Angeles, CA
  Research Assistant. Advisor: Prof. Shrikanth Narayanan — *Sep 2020 - Dec 2021*
  - Modeling and detection of personal attributes: Improved detection and classification performance of RetinaNet on OpenImages by augmenting the data with Mask-RCNN bounding box predictions.

- **National Magnetic Resonance Research Center (UMRAM)** — Ankara, TR
  Undergraduate Researcher. Advisor: Prof. Tolga Çukur — *Oct 2018 - Apr 2020*
  - Semi-supervised learning of accelerated multi-contrast MRI synthesis, undersampled across both contrast sets and k-space coefficients by leveraging randomized sampling masks across training subjects. Achieved competitive performance compared to fully-sampled training.

- **Imperial College London** — London, UK
  Research Intern at iBUG. Advisor: Prof. Maja Pantic and Dr. Stavros Petridis — *July 2018 - Sept 2018*
  - Contributed to the development of a novel audio-visual dataset, and detection of blinks and mouth openings in videos. Integrated a face detection algorithm to an existing face alignment tool which increased the performance over 45° poses.

Selected Publications

[1] Z. Fabian*, **B. Tinaz***, and M. Soltanolkotabi, "Adapt and diffuse: Sample-adaptive reconstruction via latent diffusion models," in *preparation*, May 2023.

[2] Z. Fabian, **B. Tinaz**, and M. Soltanolkotabi, "Diracdiffusion: Denoising and incremental reconstruction with assured data-consistency," Mar. 2023. [Online]. Available: https://arxiv.org/abs/2303.14353.

[3] Z. Fabian, **B. Tinaz**, and M. Soltanolkotabi, "Humus-net: Hybrid unrolled multi-scale network architecture for accelerated mri reconstruction," in *36th Conference on Neural Information Processing Systems (NeurIPS)*, 2022. [Online]. Available: https://arxiv.org/abs/2203.08213.

[4] M. Yurt, S. Dar, **B. Tinaz**, M. Ozbey, Y. Korkmaz, and T. Cukur, "A semi-supervised learning framework for jointly accelerated multi-contrast mri synthesis without fully-sampled ground-truths," in *29th annual meeting of International Society for Magnetic Resonance Imaging (ISMRM)*, Virtual Conference, May 2021.

[5] M. Yurt, **B. Tinaz**, M. Ozbey, S. U. H. Dar, and T. Çukur, "Semi-supervised learning of multi-contrast MR image synthesis without fully-sampled ground-truth acquisitions," in *Medical Imaging Meets NeurIPS*, Virtual Conference, Dec. 2020.

Honors and Awards

- **Machine Learning Summer Schools**: Attended to CIFAR DLRL (2021), MLSS (2021), and Princeton ML Theory (2022) summer schools.
- **Bilkent University Graduate Research Conference (GRC)**: Best paper award for the publication "Semi-supervised learning of mutually accelerated multi-contrast MRI synthesis without fully-sampled ground-truth", 2021
- **USC Viterbi School of Engineering/Graduate School Fellowship**: Full tuition waiver & stipend during the first year of Ph.D. program, 2020
- **Bilkent University Comprehensive Scholarship and High Honor Student**: Full tuition waiver & stipend during the B.Sc. program. High honor student for 8 consecutive semesters, 2016-2020
- **IEEExtreme 11.0 Programming Competition**: Ranked 3^{rd} in Turkey, 39^{th} in IEEE region 8 and 116^{th} among all participants as a team of three, 2017
- **Nationwide University Entrance Exam (LYS)**: Ranked 139^{th} among 2 million students in Turkey, 2016

Skills

- **Language**: English (fluent, TOEFL iBT: 109/120), Turkish (native)
- **Programming**: Python, MATLAB, LaTeX, C/C++, R
- **Libraries**: PyTorch, NumPy, Matplotlib, Scikit-Learn, OpenCV

Teaching Experience

- **University of Southern California (USC)** Los Angeles, CA
  Teaching Assistant
  - EE562 Random Processes in Engineering (Spring 2022): holding office hours and discussion sessions, preparing and grading homeworks and exams.
  - EE546 Mathematics of High-Dimensional Data (Fall 2023)

Academic Service

- **Reviewer**: COLT 2023

Extracurricular Activities and Hobbies

- **USC exploreCSR Workshop Series on Computational Media Intelligence (2021)**:
  - Mentoring undergraduates through workshop series in computational media intelligence sponsored by Google Research.
- **Bilkent IEEE Student Branch Active Member (2016-2020)**:
  - "Road to University" Volunteer (2016-2017): Introducing engineering and campus life to high school students from all around Turkey.
  - Graphics Design Team: Made several posters for the events organized by the student branch of IEEE.
- **Hobbies**: Playing the piano, Amateur Photography, Travelling, Hiking/Camping, Reading, Trekking