Mert Cemri

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EDUCATION

- **University of California, Berkeley** — Berkeley, CA, USA
  Ph.D. in Electrical Engineering and Computer Sciences — *August, 2023 - Present*
  Advisor: Prof. Kannan Ramchandran; CGPA: 4.0/4.0

- **Bilkent University** — Ankara, Turkey
  B.S. in Electrical and Electronics Engineering; CGPA: 4.0/4.0 — *September, 2019 - June, 2023*

- **École Polytechnique Fédérale de Lausanne (EPFL)** — Lausanne, Switzerland
  Exchange Semester in Computer Science — *February, 2022 - July, 2022*

RESEARCH INTERESTS

- Machine Learning, Deep Generative Models, Natural Language Processing, Distributed Processing

PUBLICATIONS

- **Published**

  - H. Bai, Y. Zhou, **M. Cemri**, J. Pan, A. Suhr, S. Levine, A. Kumar, 'DigiRL: Training In-The-Wild Device-Control Agents with Autonomous Reinforcement Learning', arXiv preprint arXiv:2406.11896, 2024. [**Accepted to NeurIPS 2024**]

  - **M. Cemri**, V. Bordignon, M. Kayaalp, V. Shumovskaia, A.H. Sayed, 'Asynchronous Social Learning', *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2023.

  - V. Shumovskaia, M. Kayaalp, **M. Cemri**, A.H. Sayed, 'Discovering Influencers in Opinion Formation over Social Graphs', *IEEE Open Journal of Signal Processing*, 2023.

- **Preprints**

  - **M. Cemri**, T. Çukur, A. Koç, 'Unsupervised Simplification of Legal Texts', arXiv preprint arXiv:2209. 00557, 2022. [**Currently Under Review**]

RESEARCH EXPERIENCE

- **University of California, Berkeley** — Berkeley, CA
  Berkeley AI Research (BAIR) Lab - Graduate Researcher — *August 2023 - Present*

  - Working on efficient deep generative model inference algorithms. In particular, for large scale LLM serving and inference, I design novel speculative decoding and multi-agent strategies to decrease latency and improve performance and alignment of LLMs.

  - Worked on developing novel discrete diffusion and posterior sampling guiding algorithms. In particular, a current application of interest is designing unseen protein sequences using discrete diffusion posterior sampling.

- **Ecole Polytechnic Federale Lausanne (EPFL)** — Lausanne, Switzerland
  Adaptive Systems Lab (ASL) - Undergraduate Researcher — *February 2022 - June 2023*

  - Worked under the supervision of Prof. Ali H. Sayed on distributed optimization and social learning.

  - Developed the theoretical model of social learning for the asynchronous case. Also conducted research on identifying the most influential agent over a social graph, and recovering the graph topology by analyzing interactions among users in social networks.

- **National Magnetic Resonance Research Center (UMRAM)** — Ankara, Turkey
  ICON Lab - Undergraduate Researcher — *March 2021 - July 2023*

  - Worked on the applications of neural networks to NLP problems and on developing novel tools to analyze graphical data using graph neural networks under the supervision of Prof. Tolga Çukur and Prof. Aykut Koç.

Work Experience

- **Titra Technology** — Ankara, Turkey
  Autonomous Driving Unit - Project Engineer — *September 2022 - June 2023*
  - Worked on reinforcement learning (RL) based autopilot systems for fixed-winged unmanned aerial vehicles.

- **The Scientific and Technological Research Council of Turkey (TÜBİTAK)** — Ankara, Turkey
  Advanced Technologies Research Institute (ATRI) - Intern — *June 2021 - August 2021*
  - Worked on electronic warfare technologies. Implemented pseudo-random number generation algorithms on an FPGA board (with VHDL), produced Gaussian noise, and harvested the noise on a Jupyter notebook.
  - Built a neural network on a PYNQ FPGA, and studied how deep learning algorithms are accelerated with FPGAs.

Skills

- **Languages**: English (Fluent, TOEFL IBT: 110/120), German (Intermediate, Goethe Zertifikat B1), Turkish (Native)
- **Programming Languages**: Python, Matlab, C/C++, VHDL, Assembly Language, LaTeX
- **Frameworks**: PyTorch, NumPy, SciPy, Keras, Linux, LTSpice, Vivado

Honors and Awards

- EECS Departmental Fellowship, UC Berkeley — 2023-2024
- Research Excellence Award, Bilkent University — 2023
- Academic Excellence Award, Bilkent University — 2023
- Merit scholarship due to outstanding academic success, Bilkent University — 2021-2023
- Tuition scholarship due to success in University Entrance Exam, Bilkent University — 2019-2023
- Bronze Medal in the International Baltic Sea Philosophical Essay Event — 2018
- Silver Medal in National Science and Technology Projects Competition for High School Students — 2018

Projects

- **Reinforcement Learning based Autopilot** In this work, we develop an RL-based controller for the attidue and landing controls of a fixed wing unmanned air vehicle. We are using PPO to do online learning.

- **Meta Learning with Zeroth Order Oracle** Studied the zeroth-order (ZO) methods in a learning to learn (L2L) framework with respect to their generalizability. In particular, Mert analyzed the zero-shot performance of these methods on new datasets and applied several optimization tricks to improve the generalization of this framework. We showed that the enhancements we made accelerate the convergence of the algorithm, and help prevent overfitting.

- **Autonomous Vehicle (EPFL Human-Robot Tandem Race '22)** Developed an autonomous vehicle that can track a particular human, and participated in EPFL Human-Robot Tandem Race with this vehicle. For detection of a selected person, we used a combination of Yolov5 and Pifpaf models, and for tracking, we used DeepSort and ReID methods.

- **Transmitter-Receiver for a AWGN Chanel that Adds Random Rotation to Messages** Built a transmitter and a receiver that creates 6-bit latent representations of 7-bit ASCII characters, send it through a WGN channel that also adds a random phase (rotation) to the signals, and successfully recover original word of 7-bit ASCII characters.

- **Gaussian Noise using PYNQ-Z1 board** Implemented Taus–88 algorithm for pseudo-random number generation (PRNG) purposes on PYNQ-Z1 FPGA and generated a Gaussian noise by combining such PRNG algorithms using the Central Limit Theorem. Harvested this noise by building a DMA channel and demonstrated it on a Jupyter notebook.

- **Catch the Mole** Developed a 2-D game using VHDL as the hardware description language and a VGA screen to display the game.

- **TRC-10 transceiver** Developed a TRC-10 transceiver with a wavelength of 10 meters.

- **Breakout Game** Participated in an intense two-week training organized by Prof. Nick McKeown of Stanford University CS Department. In this training, He developed a 2-D motion game using Java.