

İlker Işık

Computer Engineer
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Researcher experienced in machine learning and formal methods, with publications on power system restoration using reinforcement learning. Primarily aims to develop innovative techniques in machine learning by exploring formal methods and neurosymbolic reasoning.

Experience

- Researcher** June 2024 - Current
• *Novator Energy Inc.* **Python, Rust, JavaScript**
 - Research on post-disaster power system restoration using deep reinforcement learning.
- Research and Teaching Assistant** September 2022 - Current
• *METU (Middle East Technical University)* **Python, MATLAB, Rust**
 - Research on linear temporal logic and deep learning [3, 4]. Sponsored by Turkish Research Council (TÜBİTAK), project number: 122E249.
 - Teaching experience in computer vision, computer architecture and embedded systems.
- Research Internship & Student Researcher** July 2020 - September 2022
• *Cyber-Physical Systems Research Group (METU)* **JavaScript, Python**
 - First author of a reinforcement learning paper [1].
 - Created a web-based interface for a disaster management system using visualization frameworks and geographic information systems. See PowerRAFT, used in [2].
- Software Engineering Internship** July 2021 - August 2021
• *ASELSAN* **C#, JavaScript**
 - Internationalization of a program by using C# Reflection. Benchmarking serialization protocols.
- Freelance Software Developer** October 2019 - June 2020
• *Bubble IVS (Remote)* **JavaScript**
 - Developed an online game using MongoDB, Node.js, JavaScript and HTML5 Canvas.
 - Implemented a login system, integrated the app to the third-party payment services.

Education

- Middle East Technical University** Ankara, Turkey
• *MSc in Computer Engineering* 2022 - Present
 - CGPA: 4.00/4.00 (High Honor)
 - Implemented and trained SaShiMi from scratch, a deep generative model architecture for raw audio. For more information, samples and code: <https://necrashter.github.io/sashimi-796>
 - Implemented “Fine-tuning Image Transformers using Learnable Memory” from scratch. For more information and code: <https://necrashter.github.io/transformers-learnable-memory>
- Middle East Technical University** Ankara, Turkey
• *BSc in Computer Engineering* 2018 - 2022
 - CGPA: 3.96/4.00 (High Honor)
 - Senior project: “ProGeCT”, generating a city procedurally for training machine learning models.

Publications

- [1] İlker Işık, Onur Yigit Arpali, and Ebru Aydın Gol. "Optimal Policy Synthesis from A Sequence of Goal Sets with An Application to Electric Distribution System Restoration". In: *IFAC-PapersOnLine* 54.5 (2021). 7th IFAC Conference on Analysis and Design of Hybrid Systems ADHS 2021, pp. 271–276. ISSN: 2405-8963. DOI: <https://doi.org/10.1016/j.ifacol.2021.08.510>. URL: <https://www.sciencedirect.com/science/article/pii/S2405896321012854>.
- [2] İlker Işık and Ebru Aydın Gol. "Field teams coordination for earthquake-damaged distribution system energization". In: *Reliability Engineering & System Safety* 245 (2024), p. 110050. ISSN: 0951-8320. DOI: <https://doi.org/10.1016/j.ress.2024.110050>. URL: <https://www.sciencedirect.com/science/article/pii/S095183202400125X>.

Preprints

- [3] İlker Işık, Ebru Aydın Gol, and Ramazan Gokberk Cinbis. *Learning to Estimate System Specifications in Linear Temporal Logic using Transformers and Mamba*. 2024. arXiv: 2405.20917 [cs.CL]. URL: <https://arxiv.org/abs/2405.20917>.
- [4] İlker Işık, Ramazan Gokberk Cinbis, and Ebru Aydın Gol. *Interchangeable Token Embeddings for Extendable Vocabulary and Alpha-Equivalence*. 2024. arXiv: 2410.17161 [cs.CL]. URL: <https://arxiv.org/abs/2410.17161>.

Other

- First place winner in KODTÜ 3 programming contest. Also participated in other competitions.
- **Open Source Contributions** (<https://github.com/necrashter>) **C++, JavaScript, Python**
 - Created a blockchain-based federated learning intrusion detection system using PyTorch.
 - Ported DeepLTL to PyTorch.
 - Implemented char-mamba: Simple Mamba-based Character-level Language Modeling.
 - Contributed to LMMS (digital audio workstation) and Godot (game engine).
 - Other projects: a user interface for controlling UAVs, Vulkan compute shader demo, and more.
- Participated in several game jams: <https://necrashter.itch.io/>
- Amateur electric guitar player and musician. YouTube, SoundCloud.