Alperen Tercan

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Education

University of Michigan — Ann Arbor, MI
PhD in Electrical And Computer Engineering - 4.00/4.00 — *Aug. 2023 – Expected May 2027*
- Advisor: Prof. Necmiye Ozay

Colorado State University — Fort Collins, CO
Master of Science in Computer Science - 4.00/4.00 — *Aug. 2019 – Sep. 2022*
- Co-Advisors: Prof. Vinayak Prabhu and Prof. Charles Anderson
- Thesis: Solving MDPs with Thresholded Lexicographic Ordering Using Reinforcement Learning

Bilkent University — Ankara, Turkey
Bachelor of Science in Electrical and Electronics Engineering - 3.84/4.00 — *Aug. 2015 – May 2019*

Research Roles

Graduate Research Assistant — 08/2023 – Present
University of Michigan — *Ann Arbor, MI*
- Research on abstractions, robustness, constraints, and preference learning in RL
- Advisor: Prof. Necmiye Ozay

Research Intern — 06/2021 – 05/2023
Max Planck Institute for Software Systems — *Saarbrucken, Germany*
- Research on task decomposition for visual programming tasks and using large language models for programming
- Advisor: Dr. Adish Singla

Graduate Research Assistant — 08/2020 – 05/2021
Colorado State University — *Fort Collins, CO*
- Research on multi-objective RL and using formal languages for reward specifications.
- Advisor: Prof. Vinayak Prabhu

Engineering Roles

Engineering Intern — 06/2018 – 09/2018
Fraunhofer IIS — *Nuremberg, Germany*
- VHDL, Python and C based implementation of Record and Replay functionalities for GOOSE receiver

Summer Intern — 06/2017 – 07/2017
Karel Electronics — *Ankara, Turkey*
- Embedded C Programming on 8051 microcontrollers for the interface of a communication product. It takes input from the user through serial port and adjusts components. SPI and I2C protocols are used.
- Tested the product software above and revised it according to client feedback.

Publications

A. Tercan and N. Ozay. "On the relation of bisimulation, model irrelevance, and corresponding regret bounds" NeurIPS 2025 Workshop on Aligning Reinforcement Learning Experimentalists and Theorists.

A. Tercan and N. Ozay. "Initial Distribution Sensitivity of Constrained Markov Decision Processes" Conference on Decision and Control 2025

M.L. Shehab*, **A. Tercan*** and N. Ozay. "Efficient Reward Identification In Max Entropy Reinforcement Learning with Sparsity and Rank Priors" Conference on Decision and Control 2025

A. Tercan and V. Prabhu. "Thresholded Lexicographic Ordered Multi-Objective Reinforcement Learning" European Conference of Artificial Intelligence (ECAI) 2024

A. Tercan, A. Ghosh, H. F. Eniser, M. Christakis, and A. Singla. "Synthesizing a Progression of Subtasks for Block-Based Visual Programming Tasks" AAAI Conference on Artificial Intelligence 2024 Workshop on AI for Education

A. Tercan and C. W. Anderson, "Increased Reinforcement Learning Performance through Transfer of Representation Learned by State Prediction Model" 2021 International Joint Conference on Neural Networks (IJCNN)

Teaching Roles

Graduate Teaching Assistant 08/2019 – 05/2020 & 01/2022 – 05/2022
Colorado State University *Fort Collins, CO*

- Taught recitations for sophomore level Discrete Mathematics course in Computer Science Department
- Graded exams and assignments

Awards

- **MICDE Graduate Fellowship (2025):** A fellowship granted for research projects that involve the use and advancement of scientific computing techniques and practices.
- **Best Poster Award in ICON Student Research Conference 2025**: Ongoing research presented at the conference organized by Purdue University's Institute for Control, Optimization and Networks
- **Colorado State University Funding Guarantee (2019-2022):** Admission with guaranteed assistantship positions with full tuition waiver & stipend benefits during the MSc program)
- **Scholarship of the Turkish Prime Ministry (2015-2019):** Awarded monthly stipend during the BSc program (given to those who rank in first 100 among 1.8 million students in nationwide university entrance exam)
- **Bilkent University Comprehensive Scholarship (2015-2019):** Full tuition waiver & stipend during BSc
- **Nationwide University Entrance Exam (2015):** Ranked 25^{th} among 1.8 million students in Turkey

Projects

Handling Uncertainty and Leveraging V2V Predictive Information for Vehicle Control

- Development and testing of autonomous vehicle control algorithms in Mcity

Post-hoc Analysis of Neural Networks for Pose Estimation by Reverse Engineering

- Supervising an undergraduate reseacher
- Leveraged intrinsic camera parameters as metrics to assess neural network quality
- Validated methods on neural networks trained with the Waymo Open Dataset

Distributed Generative Adversarial Networks | *PyTorch, Horovod*

- Distributed training of a generative model that can create artificial paintings.

User Study Platform for Block Based Programming | *JavaScript, Django*

- Created a website to be used in the user studies for our paper.

Stateful Next Generation Access Control for Fire Response Control | *Alloy*

- Augmented NGAC framework with multi-level rule hierarchy and stateful policies.
- Showed how Alloy can be used to analyze an NGAC policy with an environment model.

Software Optimizations for Reinforcement Learning | *Tensorflow*

- Investigated effects of weight clustering in RL

Implementation of Ranking-Critical Training for Collaborative Filtering | *PyTorch*

- A personal project to better understand the use of RL for recommender systems.

Policy Gradient Methods and Hierarchical RL for Robotic Control Tasks | *PyTorch*

- Implemented DDPG, HER, Option-Critic, Modulated Policy Hierarchies
- Experimented on Mujoco Environments to test benefits of Hierarchical Reinforcement Learning.

Image Reconstruction in cr-MREPT via Iterative Methods | *MATLAB*

- Implemented genetic algorithms and gradient descent for matrix optimization in MREPT domain
- Investigated benefits of iterative methods in reconstructing Low Convection Field(LCF) regions

Maze Solving Robot using 8051 Microcontroller | *Assembly*

- Robot uses proximity sensors to perform a tree search in a maze
- Keeps track of the movements via Hall sensors and draws the explored maze on a LCD screen