

Alican Mertan, Ph.D.

My Profile

- Ph.D. in **Computer Science** from the University of Vermont (May 2026), advised by Nick Cheney in the Neurobotics Lab.
- Expertise in **solving complex reinforcement learning problems**, combining **evolutionary computation**, **quality-diversity**, and **knowledge distillation**.
- **18 journal and conference publications** with **over 300 citations** and a growing annual citation count, predominantly from first-authored work (60% of manuscripts, 93% of citations).
- Multiple first-authored publications at **GECCO**, **ALIFE**, and **EuroGP**; **Winner of the Virtual Creatures Competition** at ALIFE 2025 and **Outstanding Student** at EuroGP 2024.
- Trained **generalist policies** controlling more than two hundred robots.
- Prior expertise in **machine learning** and **computer vision** (multi-label ranking, depth estimation, 3D point clouds).
- Fluent in **Python** and **PyTorch**; experienced in scaling experiments on HPC clusters with Slurm and Apptainer.

Education

- 2026 **Ph.D. in Computer Science**, *University of Vermont, USA*
Dissertation: Models and Methods for Automated Optimization of Embodied Agents for Intelligent Behavior.
Advisor: Nick Cheney.
- 2020 **M.Sc. in Computer Engineering**, *Istanbul Technical University, Turkey*
Thesis: Application and Analysis of Deep Learning Techniques on the Problem of Depth Estimation From a Single Image.
Advisors: Gozde Unal, Damien Jade Duff.
- 2018 **B.Sc. in Computer Engineering**, *Istanbul Technical University, Turkey*
Thesis: A Classification Approach to Single Image Depth Estimation.
Advisor: Damien Jade Duff.

Research Experience

- 2021–2026 **Graduate Research Assistant**, *Neurobotics Lab, University of Vermont, USA*
- Demonstrated the challenging nature of **evolutionary brain-body co-optimization**, executing high-throughput experiments across HPC clusters.
 - Designed novel embodied agent architectures that significantly enhance **morphological computation** and evolutionary optimization of embodied agents.

2021–2026

- Trained generalist control policies for over 200 distinct robot morphologies leveraging **Quality-Diversity (MAP-Elites)**, **reinforcement learning**, and **knowledge distillation**.
- **First-authored seven publications** that contribute to **NSF grants 2008413, 2239691, 2218063**
- Researched land-use dynamics via **Agent-Based Modeling**, collaborating within multidisciplinary teams of computer scientists and urban planners.

2019–2021 **Graduate Research Assistant**, *Computer Vision and AI Lab, Istanbul Technical University, Turkey*

- Formulated **relative depth estimation** as a ranking problem, creating **calibrated multi-label ranking** algorithms.
- Contributed to **cultural heritage preservation** research, engineering automated **point cloud processing** pipelines for **BIM** generation.
- **Mentored undergraduate researchers**, guiding their graduation projects through to publication at ECAI 2025.

Awards & Achievements

- 2025 **Winner of the Virtual Creatures Competition** at ALIFE 2025
- 2024–2025 **Computer Science Graduate Award**, University of Vermont
- 2024 **Outstanding Student** at EuroGP 2024; nominated for the EuroGP Best Paper award
- 2023 **Graduate College Mini-Grant**, University of Vermont
- 2019 **2nd Place, Eatron Technologies RL Racing Competition** — trained a DQN agent in TORCS
- 2018–2021 **Student Researcher Scholarships**, Scientific and Technological Research Council of Turkey (TUBITAK 119K896, 116E167)
- 2012 **Ranked 808 of 1.8 million students** in the National University Admission Exam of Turkey

Research Life

- Talks **Invited talks**
Rajan Lab, Harvard Medical School (Nov. 2025).
Cluster of Excellence Science of Intelligence, Technical University of Berlin (Jul. 2025).
Bioinspired Robotics and Design Lab, UC San Diego (Sep. 2024).
- Review **Reviewer** for GECCO, ALIFE, IEEE TEVC, IROS, IEEE TIP, Soft Robotics (SoRo)

Skills

- Programming Python, C/C++
- ML PyTorch, NumPy; reinforcement learning, imitation learning / policy distillation, Quality-Diversity (MAP-Elites), evolutionary optimization
- Infrastructure Linux, Slurm, Apptainer, Git, Vim, $\text{\LaTeX}$; Evolution Gym, Voxcraft (physics simulations)

Peer-reviewed Publications

- Artificial Life Journal 2026 Evolutionary Brain-Body Co-Optimization Consistently Fails to Select for Morphological Potential (Accepted for publication.)
A. Mertan, N. Cheney
- ALIFE 2025 Morphological Cognition: Classifying MNIST Digits Through Morphological Computation Alone (**Winner of the Virtual Creatures Competition**)
A. Mertan, N. Cheney
- ALIFE 2025 Evolutionary Brain-Body Co-Optimization Consistently Fails to Select for Morphological Potential (**Invited to Special Issue of Artificial Life, ~4% acceptance rate**)
A. Mertan, N. Cheney
- GECCO 2025 Controller Distillation Reduces Fragile Brain-Body Co-Adaptation and Enables Migrations in MAP-Elites
A. Mertan, N. Cheney
- ECAI 2025 UniMLR: Modeling Implicit Class Significance for Multi-Label Ranking
V. B. Yesilkaynak, E. Dari, A. Mertan, G. Unal
- SAB 2024 No-brainer: Morphological Computation Driven Adaptive Behavior in Soft Robots
A. Mertan, N. Cheney
- GECCO 2024 Towards Multi-Morphology Controllers with Diversity and Knowledge Distillation
A. Mertan, N. Cheney
- EuroGP 2024 Investigating Premature Convergence in Co-optimization of Morphology and Control in Evolved Virtual Soft Robots (**Nominated for the EuroGP Best Paper award**)
A. Mertan, N. Cheney
- Land 2024 Land Stewardship and Development Behaviors Under an Ecological-Impact-Weighted Land Value Tax Scheme: A Proof-of-Concept Agent-Based Model
D. B. Walker, A. Mertan, J. Farley, D. Rizzo, T. Reynolds
- Automation in Construction 2024 Semi-automated minimization of brick-mortar segmentation errors in 3D historical wall reconstruction
M. C. Gunes, A. Mertan, Y. H. Sahin, G. Unal, M. Ozkar
- GECCO 2023 Modular Controllers Facilitate the Co-Optimization of Morphology and Control in Soft Robots
A. Mertan, N. Cheney
- CAAD 2022 Synthesizing Point Cloud Data Set for Historical Dome Systems
M. C. Gunes, A. Mertan, Y. H. Sahin, G. Unal, M. Ozkar
- Symmetry 2022 Symmetry and Variance. Generative Parametric Modelling of Historical Brick Wall Patterns
S. Altun, M. C. Gunes, Y. H. Sahin, A. Mertan, M. Ozkar, G. Unal
- C&G 2022 ODFNet: Using Orientation Distribution Functions to Characterize 3D Point Clouds
Y. H. Sahin, A. Mertan, G. Unal
- DSP 2022 Single Image Depth Estimation: An Overview
A. Mertan, D. J. Duff, G. Unal
- 3DV 2020 A New Distributional Ranking Loss with Uncertainty: Illustrated in Relative Depth Estimation
A. Mertan, Y. H. Sahin, D. J. Duff, G. Unal
- SIU 2020 Comparative Analysis of Reinforcement Learning Algorithms on TORCS Environment
D. Kamar, G. Akyol, A. Mertan, A. Inceoglu

SIU Relative Depth Estimation as a Ranking Problem
2020 **A. Mertan**, D. J. Duff, G. Unal