

Ahmet Safa Öztürk

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Ph.D. candidate in Electrical and Electronics Engineering specializing in nonlinear control, legged locomotion, and learning-based robotics. My work bridges model-predictive and data-driven approaches for robust locomotion, with additional interests in perception, sensor fusion, and intelligent systems.

EDUCATION

- Bilkent University, Turkey** *January 2021 - December 2026 (Expected)*
Ph.D. in Electrical and Electronics Engineering
Thesis Title: Data-Driven Predictive Control of Dynamic Legged Locomotion: Application to a Torque-Actuated Spring-Mass Runner
Thesis Supervisors: Prof. Ömer Morgül & Assoc. Prof. İsmail Uyanık
- Bilkent University, Turkey** *July 2017 - December 2020*
M.S. in Electrical and Electronics Engineering
Thesis Title: Neural Network-Based Estimator and Controller for SLIP and TD-SLIP Monopod Robots
Thesis Supervisor: Prof. Ömer Morgül
- Bilkent University, Turkey** *August 2012 - June 2017*
B.S. in Electrical and Electronics Engineering
- École polytechnique fédérale de Lausanne, Switzerland** *August 2015 - January 2016*
Exchange Student in Electrical Engineering

PROFESSIONAL & RESEARCH EXPERIENCE

- Hacettepe University, Turkey** *January 2022 - present*
Graduate Researcher at *Neuroscience and Robotics Laboratory*
 - Designing experimental platforms for legged locomotion
 - Collaborating on autonomous driving and sensor fusion projects
 - Developed signal processing methods to understand the behavioral mechanisms of active sensing
 - Supervised undergraduate students working on legged locomotion projects*Supervisor:* Assoc. Prof. İsmail Uyanık
- Bilkent University, Turkey** *July 2017 - present*
Graduate Research Assistant at *Bilkent Control Theory and Robotic Locomotion (CTRL) Group*
 - Conducted experiments for system identification and control of legged locomotion platforms
 - Developed learning algorithms for legged locomotion*Supervisor:* Prof. Ömer Morgül
- TÜBİTAK Youth Entrepreneurship Program, Turkey** *February 2018 - September 2018*
Interim CEO & Co-founder of *+Wear Technologies*
 - Developed a business model for a novel and developer-friendly wearable healthcare platform
- Fraunhofer Institute for Integrated Circuits IIS, Germany** *June 2016 - September 2016*
Student Intern at *Group of Intelligent Systems, Department of Electronic Imaging*
 - Developed OpenCV-based solutions for 3D head pose estimation from 2D image data*Supervisor:* Dr. Jens-Uwe Garbas
- Bilkent University, Turkey** *September 2014 - June 2016*
Undergraduate Researcher at *Bilkent Control Theory and Robotic Locomotion (CTRL) Group*
 - Designed novel experimental platforms and robots for control and legged locomotion*Supervisors:* Prof. Ömer Morgül & Assoc. Prof. Uluç Saranlı
- École polytechnique fédérale de Lausanne, Switzerland** *August 2015 - January 2016*
Project Student at *Biorobotics Laboratory, EPFL, Switzerland*
 - Designed universal gripper and visual feedback modules for the Roombots robot family (Details)*Supervisor:* Prof. Auke Ijspeert

SKILLS

Programming & Computing: Python (NumPy, PyTorch, TensorFlow), C++, C#, Java
Robotics & Control: Python (MuJoCo, Drake), MATLAB/Simulink (Control, Deep Learning, Robotics TB)
Embedded Systems & HDL: C, Assembly, ARM, AVR, VHDL, XILINX Vivado, Altium, LT Spice
Web & Database: HTML, CSS, MySQL, WordPress
Design & Documentation: SolidWorks, Adobe Illustrator/Photoshop, L^AT_EX, MS Office
Languages: English (Fluent), Turkish (Native), French & German & Spanish (Beginner)

PUBLICATIONS

Journal Articles

- [1] **A. S. Ozturk**, I. Uyanik, and Ö. Morgül, “A physics-guided neural network framework for prediction and control of spring-mass running,” *Bioinspiration & Biomimetics*, 2026, [Online]. Available: Full Text.
- [2] **A. S. Ozturk**, I. Uyanik, and Ö. Morgül, “Real-time control of a torque-actuated spring-mass hopping robot,” *Transactions of the Institute of Measurement and Control*, 2026, Under Review.

Conference Proceedings

- [3] **A. S. Ozturk**, I. Uyanik, and Ö. Morgül, “Experimental validation of an approximate analytical predictor for the torque-actuated spring-mass hopper,” in *23rd IFAC World Congress*, Accepted, [Online]. Available:Poster, 2026.
- [4] **A. S. Ozturk**, Ö. Morgül, and I. Uyanik, “Design and development of a one-legged hopping robot based on a spring-mass template,” in *2025 11th International Conference on Control, Decision and Information Technologies (CoDIT)*, [Online]. Available: Full Text, 2025.
- [5] **A. S. Ozturk**, Ö. Morgül, and İ. Uyanik, “Lstm-based gait prediction framework,” in *2025 33rd Signal Processing and Communications Applications Conference (SIU)*, [Online]. Available: Full Text, 2025.
- [6] H. C. Baykara*, E. Biyik*, G. Gul*, D. Onural*, **A. S. Ozturk***, and I. Yildiz*, “Real-time detection, tracking and classification of multiple moving objects in uav videos,” in *2017 IEEE 29th International Conference on Tools with Artificial Intelligence (ICTAI)*, (*equal contribution). [Online]. Available: Full Text - Video, 2017, pp. 945–950.

Conference Abstracts

- [7] **A. S. Ozturk**, Ö. Morgül, and I. Uyanik, “A spring-mass hopper platform for neuromechanical inquiry and bio-inspired control,” in *Neuroscience 2025*, [Online]. Available: Abstract-Poster, 2025.
- [8] **A. S. Ozturk**, Ö. Morgül, and I. Uyanik, “Neural control of running in animals,” in *Neuroscience 2024*, [Online]. Available: Abstract, 2024.

Theses

- [9] **A. S. Ozturk**, “Neural network-based estimator and controller for slip and td-slip monopod robots,” [Online]. Available: Full Text, Master’s thesis, Bilkent University, Ankara, 2020.

POSTER PRESENTATIONS AND TALKS

A Spring-Mass Hopper Platform for Neuromechanical Inquiry and Bio-Inspired Control

- Neuroscience 2025

November 17, 2025

Design and Development of a One-Legged Hopping Robot Based on a Spring-Mass Template

- 2025 11th Int. Conference on Control, Decision and Information Technologies (CoDIT)

July 15, 2025

LSTM-Based Gait Prediction Framework

- 2025 33rd IEEE Signal Processing and Communications Applications Conference (SIU)

June 27, 2025

Experimental Validation of Approximate Analytical and Neural Network-Based Solutions for Running

- 2025 33rd IEEE Signal Processing and Communications Applications Conference (SIU)

June 27, 2025

Overcoming the Accuracy—Complexity Trade-off in Legged Locomotion Using Neural Networks

- Graduate Research Conference 2025, Bilkent University

January 23, 2025

Real-Time Detection, Tracking and Classification of Multiple Moving Objects in UAV Videos

- Summer School of Artificial Learning 2017, Hacettepe University

August 22-23, 2017

- Bilkent EEE Industrial Design Projects Fair 2017, Bilkent University

June 5, 2017

HONORS AND AWARDS

- Grant Program for Participation in Scientific Meetings Abroad, TÜBİTAK 2024, 2025, 2026
- Grant Program for Participation in Scientific Meetings in Türkiye, TÜBİTAK 2025
- Second Place in Postgraduate Thesis Competition, IEEE SIU 2025 2025
- Travel Award for Workshop on Cyber-Physical Human Systems, IFAC 2024
- 5G Graduate Support Program, Information and Communication Technologies Authority 2022
- M.S. & Ph.D. Scholarship, Bilkent University: Full Tuition Waiver and Stipend 2017-Present
- Entrepreneurship Support Program, TÜBİTAK 2018
- Honor Student, Bilkent University 2017
- Voluntary Professional Activities Award, Bilkent University 2017
- Industry Oriented Research Project Support Programme for UG Students, TÜBİTAK 2016
- Swiss European Mobility Programme (SEMP), EPFL 2015
- B.S. Scholarship, Bilkent University: Full Tuition Waiver and Stipend 2012-2017
- First and Second Stage Success, Turkey National Physics Olympiads 2010, 2011
- Bronze Medal, Turkey National Elementary Mathematics Olympiads 2008

TEACHING EXPERIENCE

Teaching Assistant at Bilkent University: Mentored over 300 students through graduation projects.

- EEE 491 Electrical and Electronics Engineering Design I (Fall 2020 - Fall 2025)
- GE 401-402 Innovative Design and Entrepreneurship I-II (Fall 2019, Spring 2020)
- EEE 493-494 Industrial Design Project I-II (Fall 2017, Spring 2018)
- EEE 102 Introduction to Digital Circuit Design / EEE 202 Circuit Theory (Fall 2016)
- PHYS 120 Physics for Poets (Spring 2015) / PHYS 101 General Physics (Fall 2014)

ACADEMIC SERVICES AND OUTREACH

System Administrator at Bilkent EEE Department *August 2017-Present*

- Designer and editor at the department website (Link)
- Responsible for the organization and preparation of the curriculum and accreditation documents

Vice Chair at Bilkent EEE Graduate Research Conference *2018-2026*

Organization Team Member at Bilkent Uni. Stochastic Systems, Games, and Control Workshop *July 2026*

Organization Committee Member at The Science Academy of Turkey, Bilkent University Communication Summer School *July 2025*

Organization Team Member at 5th IFAC Workshop on Cyber-Physical Human Systems *December 2024*

Organization Team Member at European Researchers' Night, Hacettepe University *September 2024*

Organizer at Bilkent Youth Academy *2016-2020*

- Introduced computer vision and robotics to high-school students with hands-on experience

Student Chair at Bilkent EEE Graduate Research Conference *2015*

Organizing Committee Member at Bilkent EEE Industrial Design Projects Fair *2015-2018*

Organization Team Member at Bilkent Physics Olympiads *2014-2015*

Organization Team Member at Bilkent University Road to University *2014-2017*

Web Team Member at IEEE Bilkent University Student Branch *2014*

Founder of Robotics and Automation Society Chapter at IEEE Bilkent University Student Branch

SELECTED PROJECTS

CATAN[®] Object Manipulator: (Video) *January 2023*

Developed a robotic manipulation station for board game objects using instance segmentation and object detection. [Python (Open3D, PyTorch, Drake)]

Image Captioning with Recurrent Neural Networks: *January 2019*

Developed a program to embed words and extract features with a pre-trained CNN and caption images with different RNN architectures. [MATLAB (Deep Learning Toolbox), Python (Keras)]

Neural Networks on Games: *May 2018*

Developed a game-play project using evolving neural networks and deep Q-learning networks (DQN). [MATLAB (Deep Learning Toolbox), Python (Keras)]

Two-Wheeled Self-Balancing Mini Mobile Robot: *May 2016*

As a group of three, we developed a mini-scaled mobile robot that can balance on two wheels and support varying weights in its container. [Arduino, SolidWorks, Altium]

EXTRA-CURRICULAR

Technical Activities: Designed an Autonomous Aerial Vehicle (AAV) for the Teknofest Aerospace and Technology Festival (2019)

Voluntary Activities: Certificate of Education on Animal Life and Rights (2018)

Organized an orienteering event for women and children under social services care (2017)

Volunteered in IEEE Women in Engineering Events (2014, 2015)

Hobbies and Sports: Photography, Swimming, Strength Training, Wing Tsun, Board Games, Puzzles