

Mustafa Ugur

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EDUCATION

Phd
AUG. 2023
MAY 2028

Purdue University,
Mechanical Engineering, Robust And Adaptive Design Laboratory
• Advisor: Prof. Laura Blumenschein

MS
SEP. 2020
JULY 2023

Bilkent University, Turkey
Mechanical Engineering, Miniature Robotics Laboratory
• Advisor: Prof. Onur Ozcan
• M.Sc. Thesis: ReMBot: A Reconfigurable, Miniature, Modular Robot with Soft Connection Mechanisms

BS
SEP. 2015
JUNE 2020

Yildiz Technical University, Turkey
Mechatronics Engineering
• CGPA: 3.56 / 4.00 (Ranked as the second in department)
• Senior Thesis: Feeding Assistant Robot for Disabled People

PUBLICATIONS (ORCID Link)

Journal Articles

- M. Uğur, Y. Yaman, B. Arslan and O. Özcan, "ReMBot: A Reconfigurable, Miniature, Modular Robot with Compliant and Rigid, Magnetic Connection Mechanisms", Soft Robotics, 2023 (submitted)
- M. Askari, M. Uğur, N. Mahkam, A. Yeldan and O. Özcan, "Control and Study of Bio-Inspired Quadrupedal Gaits on an Underactuated Miniature Robot", Bioinspiration & Biomimetics, 2023, doi:10.1088/1748-3190/acb127, (co-first author) [link](#)
- M. Uğur, M. Uygun, A. Bakır and O. Özcan, "Path Tracking and Connection Mechanism of a Reconfigurable, Foldable, Legged, and Miniature Robot," Hittite Journal of Science and Engineering, vol. 9, no. 3, pp. 205-211, Sep. 2022, doi:10.17350/HJSE19030000272 [link](#)
- N. Mahkam, M. Uğur and O. Ozcan, "Effect of Feet Failure and Control Uncertainties on the Locomotion of Multi-Legged Miniature Robots," in IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 5568-5574, April 2022, doi: 10.1109/LRA.2022.3157945, (co-first author) [link](#)

Conference Proceedings

- M. Uğur, B. Arslan, A. Özzeybek and O. Özcan, "Effects of Compliance on Path-Tracking Performance of a Miniature Robot," 2023 IEEE International Conference on Soft Robotics (RoboSoft), Singapore, Singapore, 2023, pp. 1-6, doi: 10.1109/RoboSoft55895.2023.10122013. [link](#)

Workshops & Symposiums

- M. Uğur, B. Arslan, and O. Ozcan, "Reconfigurable, Foldable and Miniature Robot," Challenges and Opportunities of Bio-inspired Design, Actuation, and Locomotion Workshop in ICRA2022, 2022 [link](#)
- M. Uğur, J. M. Ferguson, E.B. Pitt, S. D. Herrell III, and R.J. Webster III, "Image Guidance for the Da Vinci Robot," VUSE Summer Research Program Symposium, 2019 [link](#)

RESEARCH EXPERIENCE

2020–2023

Design, manufacturing, control of a c-legged, soft, reconfigurable robot, Bilkent Miniature Robotics Lab, Bilkent University

- Designed and manufactured a printed circuit board (PCB) with ESP32 microcontroller on it.
- Created a path-tracking algorithm in Python that works with a motion capture system.
- Designed and manufactured soft parts of the robots i.e., legs and backbones.
- Designed 2D folding patterns for the body of the robot and manufactured them with a laser cutter.

Gait and locomotion analysis of a miniature quadruped, Bilkent Miniature Robotics Lab, Bilkent University

- Helped to develop a Linear Quadratic Gaussian (LQG) controller for miniature robots.
- Helped to improve a dynamic simulation on MATLAB for miniature robots.
- Done gait analysis of a four-legged miniature robot, MinIAQ.
- Investigated the effects of different design parameters of a miniature robot on its locomotion.

SEP. 2019
AUGUST 2020

Feeding Assistant Robot for Disabled People, Biomechatronics Laboratory, Yildiz Technical University

- Investigated robot kinematics and dynamics, trajectory planning and created simulation environment with MATLAB Robotics System Toolbox.
- Created a software to drive the robot arm.
- Trained some deep learning models with YOLO V2 algorithm to detect close/open eyes and close/open mouth.
- Supported by Scientific and Technological Research Council of Turkey (TUBITAK) as 2209B Undergraduate Research Scholarship.

JUNE 2019
SEP. 2019

Image Guidance for the Da Vinci Robot, MEDLab, Vanderbilt University

- Made improvements in an existing GUI for image guidance software using Python which runs in the 3D Slicer.
- Created new data acquisition module for the da Vinci Xi which built with Plus Toolkit and written in C++. This module was able to take joint values from robot and calculate forward kinematics.
- Improved an existing data acquisition module for a Blackmagic Declink device which is planned to use in an ultrasound probe. This module was written in C++ and built with Plus Toolkit.
- Attended clinical experiments in medical center with surgeons.

PROFESSIONAL & ACADEMIC EXPERIENCE

Research Mentor &
Teaching Assistant
2020–2023

Bilkent University, Turkey

- Mentored three undergraduate students (Burak Arslan, Alperen Ozzeybek, Simay Dilek, and Ayse Duru Yilmaz) in the lab on different aspects of modular robots.
- Mentored four groups (24 students) for their senior design project.

Internship
2017, SUMMER

Sahinler Machine, Turkey

- Created an industrial design for a machine part and produced it with CNC machine.

Internship
2016, SUMMER

R&D Robotics, Turkey

- Built an automation systems for a car seat factory with PLC.

FELLOWSHIP & AWARDS

2023-PRESENT	Ross Fellowship, <i>Purdue University</i>
2020-2023	Full Graduate Fellowship, <i>Bilkent University</i>
2019-2020	Undergraduate Research Scholarship, <i>Scientific and Technological Research Council of Turkey</i>
2019, SUMMER	VUSE Summer Research Program Fellowship, <i>Vanderbilt University</i>
2018-2020	Ministry of Youth and Sports Scholarship, <i>Ministry of Youth and Sports</i>
2018-2020	Yesil Rotary Club Scholarship, <i>Yesil Rotary Club</i>
2018-2020	Ronesans Education Foundation Scholarship, <i>Ronesans Education Foundation</i>
2017-2020	Bursa Chamber of Commerce and Industry Scholarship, <i>Bursa Chamber of Commerce and Industry</i>
2016-2020	BAHS Alumni Association Scholarship, <i>BAHS Alumni Association</i>
2015-2020	Orhan Education Foundation Scholarship, <i>Orhan Education Foundation</i>
2015-2020	Aktas Education Foundation Scholarship, <i>Aktas Education Foundation</i>

EXTRACURRICULAR ACTIVITIES

Mentor 2021-PRESENT	Mentoring undergraduate students from all around the country about research internships, research in robotics and mechanical engineering at a voluntary organization named Acik Ofis Saati.
Volunteer 2018-2019	Worked in the information technology department of The Educational Volunteers Foundation of Turkey (TEGV), the most significant foundation in Turkey to help kids in their education.

SKILLS & ABILITIES

Programming	C++, C, Python, MATLAB/Simulink, CCS C, Labview
Software	AutoCAD, SolidWorks, EAGLE, Prusa Slicer, Adobe Illustrator, Adobe Photoshop
Tools, Libraries	ROS, WebSocket, NatNet, 3D Slicer, Plus Toolkit, CMake, Git, Latex
Languages	English (fluent), Turkish (native)

ONLINE COURSES

Fundamentals of Reinforcement Learning on Coursera, Certificate link
Convolutional Neural Networks on Coursera, Certificate link
Structuring Machine Learning Projects on Coursera, Certificate link
Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization on Coursera, Certificate link
Neural Networks and Deep Learning on Coursera, Certificate link
ROS for Beginners: Basics, Motion, and OpenCV on Udemy, Certificate link
Python Data Structures by University of Michigan on Coursera, Certificate link
Programming for Everybody by University of Michigan on Coursera, Certificate link
Machine Learning by Stanford University on Coursera, Certificate link