

# 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

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## 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, <a href="#">Certificate link</a>
Convolutional Neural Networks on Coursera, <a href="#">Certificate link</a>
Structuring Machine Learning Projects on Coursera, <a href="#">Certificate link</a>
Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization on Coursera, <a href="#">Certificate link</a>
Neural Networks and Deep Learning on Coursera, <a href="#">Certificate link</a>
ROS for Beginners: Basics, Motion, and OpenCV on Udemy, <a href="#">Certificate link</a>
Python Data Structures by University of Michigan on Coursera, <a href="#">Certificate link</a>
Programming for Everybody by University of Michigan on Coursera, <a href="#">Certificate link</a>
Machine Learning by Stanford University on Coursera, <a href="#">Certificate link</a>