Damla LEBLEBİCİOĞLU

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PERSONAL

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EDUCATION

Doctor of Philosophy in Electrical Engineering **2022-2026**
Concentration: Robotics
CGPA: 4.00/4.00
Northeastern University, Boston, MA
Department of Electrical and Computer Engineering Fellow

Master of Science in Mechanical Engineering **2018-2021**
Concentration: Dynamics & Control Theory
CGPA: 3.30/4.00
Bilkent University, Ankara, Turkey
Bilkent University Merit Scholarship

Bachelor of Science in Mechanical Engineering **2014-2018**
CGPA: 3.22/4.00
Bilkent University, Ankara, Turkey
OSYM University Entrance Examination Scholarship

RESEARCH EXPERIENCE

Graduate Research Assistant **2022-2026**
Programmable and Reconfigurable Soft Engineered Systems (PARSES)
Northeastern University, Electrical and Computer Engineering
Advisor: Assoc. Prof. Dr. Kris L. Dorsey
LAB website: https://parses.sites.northeastern.edu

Working on ***Sensors for Persistent Edema Monitoring***. The goal is to deliver an actionable marker of a person's fluid retention state. In several diseases, fluid retention is a key symptom and directly impacts health. Combination of soft mechanical sensors and vision measurements will be used to record the dynamic changes in a limb's circumference and tissue stiffness across hours to a day, machine learning approaches will be used to compare these measurements with clinical ground truth measurements of fluid retention state.

Graduate Research Assistant **2018-2021**
Smart Mechanical Systems Laboratory
Bilkent University, Mechanical Engineering
Advisor: Assist. Prof. Dr. Melih Çakmakcı

Master's Thesis, Bilkent University/October 2021
Title: Learning Based Control Compensation for Multi-Axis Gimbal Systems Using Inverse and Forward Dynamics
Advisor(s): Assist. Prof. Dr. Melih Çakmakcı & Dr. Özgür Ateşoğlu

- ***Keywords:*** Multi-axis Gimbal System, Real-Time Control, Neural Network, Multi-Body Dynamics Modeling, ADRC (Active Disturbance Rejection Control), Inverse Dynamics, Disturbance Torque Compensation, Monte Carlo Simulations

***It is available at Bilkent University, Institutional Repository with the link:**
http://repository.bilkent.edu.tr/handle/11693/76608

Undergraduate Research Assistant **2017-2018**
ULTRAMEMS Research Group
Middle East Technical University, Electrical and Electronics Engineering, Ankara, Turkey

Advisor: Prof. Dr. Barış Bayram

- Worked on diamond-based capacitive micro-machined ultrasound transducers for potential applications of drug delivery and treatment of Alzheimer's disease.

BS Graduation Project **2017-2018**

Vertical Launcher System

Project was supported by ROKETSAN Missiles Inc. and TUBITAK 2209/B program.

- Built a fully adjustable vertical launcher prototype that will be mounted on a ground platform.
- Kinematic motion analysis is performed at SAM, cell wall thickness of the launching tubes is determined using COMSOL, mechanical design is done by SolidWorks, Arduino is used for the actuation and control of DC motors and linear actuators.

(*TUBITAK: National Science Foundation)

TEACHING

Teaching Assistantship **2018-2021**

Graded quiz and homework papers, lab proposals. Hold office hours, proctored midterm & final exams.

- **ME 440 Automotive Engineering** ***(Fall 2018-2019, Fall 2019-2020)***
- **ME 342 Dynamics and Control II** ***(Spring 2018-2019, Spring 2019-2020)***
- **ME 481-482 Mechanical Engineering Design I-II** ***(Fall, Spring 2020-2021)***

Supervised senior students for the industry-based graduation projects. Design projects that I mentored are (industrial partner is, ROKETSAN Missiles Inc.):

- Mechanical Design of a Roll-Pitch Gimbal and Solving the Zenith Pass Problem
- Cold Launch of a Low Orbital Missile

PUBLICATIONS

[J1] D. Leblebicioglu, O. Atesoglu, M. Cakmakci, "Machine Learning Based Control Enhancement for Multi-Axis Gimbal Systems Using Inverse and Forward Dynamics", *European Journal of Control*, submitted for publication [March, 2024]. (https://arxiv.org/ftp/arxiv/papers/2112/2112.02561.pdf)

[C1] D. Leblebicioglu, O. Atesoglu, M. Cakmakci, "Physics-Informed Disturbance Estimation and Nonlinear Controller Design for a Multi-Axis Gimbal System", *IFAC-PapersOnLine,* vol. 55, no. 37, Oct. 2022, pp. 530–535.

INDUSTRIAL EXPERIENCE

Senior Mechanical Design Engineer **Sept. 2018-May 2022**
ROKETSAN Missiles Inc., Ankara, Turkey

**ROKETSAN is an establishment of Turkish Armed Forces Foundation (TAFF).*

- Worked as a mechanical design engineer of an IIR Seeker of the ATMACA-Anti Ship Cruise Missile.
- **3+ years' experience with:**
  (i) mathematical & dynamical modeling using MATLAB/Simulink,
  (ii) gimbal mechanical design using Catia v5 & SolidWorks,
  (iii) gimbal components (encoders/resolvers, DC motors, gyroscope, etc.),
  (iv) controller implementation for the physical gimbal set-up using xPC Target and LabVIEW Real-Time.

Intern **Aug. 2017-Aug. 2018**
Desistek Robotics Inc., Ankara, Turkey

** Desistek builds and designs unmanned sea vehicles that have auto-control, wide visual range, and the capability of working at different sea levels.*

- Investigated the working principles of ROVs and formed the mathematical model of SAGA (mini-ROV designed by Desistek Robotics) in Simulink. Gained experience on Ardu-Pilot and Pixhawk.

Intern **Aug. 2016-Aug. 2016**
Turkish Aerospace Industries Inc., Ankara, Turkey

** TAI is a subsidiary of Turkish Armed Forces Foundation (TAFF) and Presidency of Defense Industries of Turkish Republic (SSB).*

- Focused on the mechanical design and manufacturing processes used for the components of T129 ATAK Helicopter.

SKILLS

MATLAB, Simulink, Catia v5, SolidWorks, Simulink Real-Time (xPC Target), COMSOL, Arduino (C++)

OUTREACH AND VOLUNTEERING

Member of Bilkent University Social Awareness Projects

- Participated in the "Sun Rises from the Village" project (GUNKOY). In this project, we renovated a primary school in İznik, Turkey (it was in the west of Turkey, considered to be in a rural area). Furthermore, we built a school library and filled the shelves with books that we collected as donations from Bilkent University students and faculty members.

Member of **European Youth Parliament (EYP)**

**EYP is a platform dedicated to young European students aged from 18-25, where they can share their ideas on political and social issues and build intercultural relationships.*

- Attended the following conferences:
  - 12th National Selection Conference of EYP Turkey, İstanbul, Turkey
  - Austrian Youth Summit, Linz, Austria
  - Marseille'15 Summer Health Forum of EYP France, Marseille, France
- Finance Officer of EYP Turkey @2015-2016 Academic Year

Member of ESTIEM (European Students of Industrial Engineering and Management)

- Attended: Vision Madrid "Materials for Nuclear Applications" Workshop, Universidad Politécnica de Madrid, Spain