

UMIT SEN

PERSONAL

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EDUCATION

DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING

· 2024 - Present

UNIVERSITY OF MASSACHUSETTS AMHERST · MA, USA

Current GPA: 4.00/4.00 ·

BACHELOR OF SCIENCE IN MECHATRONICS ENGINEERING

· 2019 - 2023

KADIR HAS UNIVERSITY · Istanbul, Turkey

GPA: 4.00/4.00 · Valedictorian

RESEARCH EXPERIENCE

- **SOFT ROBOTIC SNAKE DESIGN & LOCOMOTION** · 9/2024 - Present
PhD RESEARCH. Advisor: Assist. Prof. Gina OLSON
Working on soft robotic snake robot to achieve snake-like locomotion based on frictional anisotropy. Prototyping and fabricating pneumatic McKibben actuators and designing bio-inspired robotic skins through elastomer molding and FDM-based thermoplastic printing. Designed friction experiments and analyzed locomotion data to link friction properties with locomotion outcomes. First-year PhD research performance led to the award of two competitive fellowships.
- **WRIST-WORN HAPTIC DEVICE** · 10/2022 - 7/2023
SENIOR THESIS · Advisor: Assist. Prof. Mine SARAC STROPPA
Designed and developed a wrist-worn haptic device based on a custom-made voice coil actuator. Built an electronic board for communication and control of the device, and designed a 3D-printed mechanical case for the actuator. Conducted user studies to validate the performance. Presented the work in the **2023 IEEE World Haptics Conference** as a **poster**.
- **VISIBLE LIGHT POSITIONING** · 2/2021 - 9/2022
Advisors: Emeritus Prof. Erdal PANAYIRCI, Assoc. Prof. Taner ARSAN
Performed MATLAB simulations for spatial modulation-based 3D indoor positioning algorithm. Designed simulation parameters like user trajectory, and worked on data analysis using the Monte Carlo method. This research resulted in a publication in the **Optics Communications journal**.
- **ROBOT SWARM COORDINATION** · 10/2020 - 10/2022
Advisor: Prof. Feza KERESTECIOGLU
Worked on communication-free robot group formation based on local strategies with cost-minimization. Specifically focused on developing necessary cost functions, and simulation parameters to obtain arc group formation. Conducted MATLAB simulations for different navigation trajectories. This work concluded with a paper in the **Adaptive Behavior journal**.

JOURNAL PUBLICATIONS

- B. Kudsi, D, Xu, **U. Sen**, K.T. Yoshida, F. Stroppa, C.M. Nunez, M. Sarac, “Gamifying Haptics User Studies: Comparison of Response Times From Smartphone Interfaces,” *IEEE Trans. Haptics*, vol. 18, no. 2, pp. 423–429, Apr. 2025, doi: 10.1109/TOH.2025.3536885.
- A. Adeyemi, **U. Sen**, S. M. Ercan, and M. Sarac, “Hand Dominance and Congruence for Wrist-Worn Haptics Using Custom Voice-Coil Actuation,” *IEEE Robot. Autom. Lett.*, vol. 9, no. 4, pp. 3053–3059, Apr. 2024, doi: 10.1109/LRA.2024.3360815.

- U. Sen, Y. E. Yesilirmak, I. O. Bayman, T. Arsan, E. Panayirci, and N. Stevens, "3D indoor positioning with spatial modulation for visible light communications," *Optics Communications*, vol. 529, p. 129091, Feb. 2023, doi: 10.1016/j.optcom.2022.129091.
- F. Kerestecioğlu, Ü. Sen, Ç. Işıkver, and A. Göktekin, "Circular formations of non-communicating robot groups via local strategies," *Adaptive Behavior*, vol. 32, no. 4, pp. 291–300, Aug. 2024, doi: 10.1177/10597123231204627.

CONFERENCE PUBLICATIONS

- Y. Nandwana,, U. Sen, G.Olson, "A Highly Articulated Backbone for Soft Snake Robots" in *Living Machines*, Sheffield, UK, 2025. [Accepted]
- Sen, U., Sarac, M. "Design for Wrist-Worn Haptic Device with Custom Voice Coil Actuation," in *2023 IEEE World Haptics Conference (Work-in-Progress)*, Delft, Netherlands, 2023.
 - Presented as a **poster** at the conference.

WORK EXPERIENCE

ASELSAN

· 8/2023 - 8/2024

Control Design Engineer - Full Time

Worked on developing algorithms to automate and improve the controller design process with frequency domain analysis on MATLAB/Simulink. Deployed and debugged control architectures on industrial-grade hardware platforms. Performed system identification to analyze the dynamic behavior of 2-DoF and 3-DoF antenna systems.

AWARDS & HONOURS

- **Robert and Deanna Hagerty Scholarship** · 2025
\$3,000 merit based award given for an interest or excellence in the field of Robotics through coursework, research and/or extracurricular activities.
- **Joseph E. Motherway Fellowship** · 2025
Monetary award given to an outstanding student for their work in the area of design at University of Massachusetts Amherst.
- **Kadir Has University** · 2023
First Top Ranking Graduate of Kadir Has University among the Class of 2023.

ADDITIONAL ACADEMIC INVOLVEMENT

STUDENT VOLUNTEER: Worked as a Student Volunteer at the **2023 World Haptics Conference in Delft, Netherlands**. In addition to presenting a poster, I provided help during presentation sessions, workshops, and conference registration.

ASSISTANTSHIPS: Took responsibility as a **Teaching Assistant** in the courses listed below.

· MIE124 - Computer Prog. for Eng. Problem Solving (Graduate TA)	· Spring 2024 - 2025
· KHAS109 - Computational Thinking (Undergrad TA)	· Fall 2022 - 2023
· KHAS110 - Civic Responsibility Project (Undergrad TA)	· Spring 2021 - 2022
· KHAS101- Origins and Consequences (Undergrad TA)	· Fall 2021 - 2022
· TLL102 - Critical Reading and Writing in Turkish II (Undergrad TA)	· Spring 2020 - 2021
· TLL101 - Critical Reading and Writing in Turkish I (Undergrad TA)	· Fall 2020 - 2021

SKILLS

- **PROGRAMMING SKILLS:** MATLAB, Simulink, Python, C#, Unity3D, LATEX, ROS, MicroPython, Arduino
- **PROTOTYPING SKILLS:** SolidWorks, Fusion360, Ansys, FDM 3D Printing, Elastomer Modeling, Mechatronic Design
- **LANGUAGE SKILLS:** Turkish (Native), English (Advanced, TOEFL iBT: 107)