

Berkem VURAL

Engineer, Research Fellow

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EDUCATION

🎓 2024 **M.Sc.**, Control and Automation Engineering, Yildiz Technical University, Istanbul, Turkiye GPA:3.71/4
Thesis title: Designing and Implementation of an EMG Driven Upper Limb Exoskeleton
(*The full thesis is available via the following [link](#) – Thesis no: 893163*)



🎓 2022 **M.Sc.**, Biomedical Engineering, Politecnico di Milano, Milan, Italy GPA:25.17/30
Thesis title: Identifying the Heart Dynamics Parameters by a Neural Network Assessing Hill Model Features of the Myocardium: a Study on Mock-Loop Data (*The full thesis is available via the following [link](#)*)



🎓 2018 **B.Sc.**, Mechatronics Engineering, Yildiz Technical University, Istanbul, Turkiye, GPA:3.32/4
Thesis title: Designing of a Lower Limb Exoskeleton (*Full text is available via the following [link](#)*)



2015-16 **B.Sc.**, Mechatronics Engineering, Vilnius Gediminas Technical University, Vilnius, Lithuania Erasmus+ exchange student



🎓 2024 **AS**, Computer Programming, Anadolu University, Eskisehir, Turkiye GPA:3.19/4



🎓 2022 **AS**, Web Design and Coding, Anadolu University, Eskisehir, Turkiye GPA:3.05/4

🎓 2018 **AS**, Business Management and Administration, Anadolu University, Eskisehir, Turkiye GPA:3.67/4

EMPLOYEMENT HISTORY

2025 - ... **Research Fellow**, Full time, Researcher at Wearable Robotics Laboratory in Santanna Biorobotics Institute, Developed control algorithms for lower-limb exoskeletons, specifically focusing on heart rate-based controllers for resistance training and rehabilitation systems.



2022-2025 **Research and Teaching Assistant**, Full time, TA for many lectures: Automation Lab, Electronics and Measurement Lab., System Dynamics, Modeling and Simulation, Process Control, Signals and Systems at **YTU** Control and Automation Engineering Department



2021-2022 **Project engineer**, Freelance, Project engineer at **Phinite Lab** - a start-up company at YTU Technopark, Istanbul, Turkiye – Developed an automated antenna tracking system for UAVs to enhance signal stability and long-range communication, Designed a comprehensive cardiovascular system model to simulate physiological dynamics for R&D purposes.



2018-2020 **Mechatronics engineer**. Part time, **Eldor Corporation**, Milano, Italy – Designed the mechanical structure of a remote controller for Zehus e-bikes using CAD/CAM tools, overseeing the entire process from feasibility studies and material selection to production integration, while providing technical support for the integration of electronic circuit boards for **Zehus e-bikes**



2017 **Intern engineer**, Internship, **Ingeniaris Lda**, Coimbra, Portugal - Designed and 3D-prototyped an autonomous maze-solving robot, implementing sensor-fusion algorithms for real-time environment mapping and board-level data acquisition to optimize navigation.



2016 **Intern researcher**, Internship, **The Scientific and Technological Research Institution of Turkiye**, Kocaeli, Turkey - Designed and simulated an electronic circuit for a defibrillator at the National Metrology Lab of Biomedical Applications, while actively participating in the calibration and standardization testing of diverse medical devices to ensure compliance with national healthcare regulations.



2014-2018 **Intern engineer**, Internship, - **OZURGEN Agriculture Machinery**, Corum, Turkiye - Contributed to the CAD/CAM team in the design and manufacturing of conveyor belt systems, while providing engineering support for diverse agricultural machinery solutions, including airlock systems and storage silos for food processing plants.



SKILLS

Language	Turkish (native) English (advance) Italian (elementary)
Modeling & CAD	MATLAB/Simulink, LabVIEW, OpenSim, Solidworks, AutoCad, TinkerCad
Coding	C, C++, C#, Python
Electronics – boards	Multisim, LTSpice, STM32
Automation	PLC Programming, TIA Portal
Miscellaneous	Academic research, teaching, training, LaTeX typesetting and publishing, MS tools

AFFILIATIONS

Association for the Support of Contemporary Life
(The association helps girls across Turkiye to obtain an education, ultimately promoting gender equality.)
IEEE Student
UCTEA Chamber of Mechanical Engineers
ESTIEM
(European Students of Industrial Engineering and Management-Alumni)

PROFESSIONAL INTERESTS

My research and professional interests encompass control theory and real-time systems, with a specialized focus on biomechatronics, biorobotics, and AI-driven control through machine learning and reinforcement learning. I am also deeply engaged in mechatronic system design, signal processing, medical imaging systems, and the development of wearable technologies for health monitoring.

TEACHING HISTORY

In my role as a Research Assistant at Yildiz Technical University, specifically within the Department of Control and Automation Engineering, I served as a Teaching Assistant for several core courses, including KOM4630 Process Control, KOM2711 Signals and Systems, Applications in Control Engineering, KOM2712 System Dynamics, and Modeling and Simulation. Additionally, I lead the laboratory sessions for KOM2742 Electrical Circuits, KOM3771 Industrial Automation Systems, KOM3782 Electronic Circuits and Measurement, KOM3792 Control Laboratory, and KOM3772 Industrial Automation Systems Laboratory I. Detailed information regarding the course contents and the program curriculum can be accessed via this [link](#).

PUBLICATIONS

Journal

- Vural, B., Taş, A. İ., Özden, A. B., Aydn, M., İşcan, M., & Yılmaz, C., (2022). DISCRETE TIME-BASED FEEDBACK LINEARIZATION CONTROLLER APPROACH FOR ROBOT MANIPULATOR. F.U. Uzay ve Savunma Teknolojileri Dergisi , vol.1, no.1, 180-185.
- İŞCAN, M., TAŞ, A. İ., Vural, B., Özden, A. B., & YILMAZ, C., (2022). ANTENNA TRACKER DESIGN WITH A DISCRETE LYAPUNOV STABILITY BASEDCONTROLLER FOR MINI UNMANNED AERIAL VEHICLES. International Journal of Multidisciplinary Studies and Innovative Technologies, vol.6, no.1, 77-85.
- İŞCAN, M., YILMAZ, A., Vural, B., YILMAZ, C., & TUZCU, V., (2022). A Novel QT Interval Analysis Method Based On Continuous Wavelet Transform and Philips Algorithm. Journal of Engineering and Science in Medical Diagnostics and Therapy, vol.5, no.1, 1-7.
- İŞCAN, M., YILMAZ, C., Vural, B., & Eken, H., (2022). Modeling and Simulation of a Lower Limb Exoskeleton System with Pathologic Cases. ASME Journal of Engineering and Science in Medical Diagnostics and Therapy.

Conferences

- Vural, B., & Yasar, C. F., (2023). *Design of an Upper Limb Exoskeleton Controlled by Extremum Seeking Control Based EMG Signal Alteration*. Otomatik Kontrol Türk Milli Komitesi Ulusal Kongresi TOK2023 (pp.1-7). İstanbul, Turkey
- Azanpa, M., Vural, B., Taş, A. İ., Özden, A. B., & İşcan, M., (2022). *Lyapunov Control Method Based Optimal Control of Alpha-Type Stirling Motor*. 4th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, Ankara, Turkey
- İŞCAN, M., Taş, A. İ., Vural, B., Özden, A. B., & YILMAZ, C., (2022). *ANTENNA TRACKER DESIGN WITH A DISCRETE LYAPUNOV STABILITY BASED CONTROLLER FOR MINI UNMANNED AERIAL VEHICLES*. 4th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, Ankara, Turkey
- Taş, A. İ., İşcan, M., Özden, A. B., Çinar, E., Vural, B., & Yılmaz, C., (2022). *Real Time Discrete Control Algorithm for Gimbal System Design in Mini Unmanned Aerial Vehicles*. 4th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, Ankara, Turkey

SCHOLARSHIPS

I was a recipient of both the MAECI (Study in Italy) and the DSU (Lombardia Region) grants during my Master's degree at Politecnico di Milano, awarded based on academic merit and excellence.

CERTIFICATIONS

Some of the certificates from several different institutions, MOOCs, seminars, and diplomas please click on this [link](#).

REFERENCES

Prof. Dr. Cuneyt Yilmaz, Yildiz Technical University, Mechatronics Eng. cuneyt@yildiz.edu.tr
Prof. Dr. Veysel Gazi, Yildiz Technical University, Control and Automation Eng. vgazi@yildiz.edu.tr
Asst. Prof. Claudia F. Yasar, Yildiz Technical University, Control and Automation Eng. cfyasar@yildiz.edu.tr