CURRICULUM VITAE

Name and Surname	Gizem Doğa FİLİZ
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EDUCATION

2025 – 2027 (Expected) **Master of Science, Politecnico di Milano, Milan, Italy**
Automation and Control Engineering

2020 - 2025 Bachelor of Science, Sabancı University, Istanbul, Turkey
Mechatronics Engineering; GPA: 3.50 / 4.

2018 – 2020 Nesibe Aydın Schools Kocaeli, Turkey

2016 - 2018 Private ENKA Vocational and Technical Anatolian Highschool, Turkey
Industrial Automation department.
Related Courses: C#, Arduino, hydraulic, pneumatic, electronic circuit design and drawing, technical drawing, sequential control and PLC.

WORK EXPERIENCE

May – July 2025 **Munich Institute of Robotics and Machine Intelligence (MIRMI) Lab.:**
Supervisors: Prof. Sami Haddadin & Dr. Kübra Karacan

- Developed vision-augmented force-impedance control framework for autonomous surface cleaning using Franka Emika Panda robot and Intel RealSense D455 camera.
- Implemented Markov Decision Process (MDP) planner with Bayesian belief updating for intelligent surface coverage motion planning and real-time stain detection on unknown 3D surfaces.
- Designed adaptive stiffness control algorithm integrating tactile feedback, surface normal estimation, and multi-level compliance adaptation for optimal cleaning effectiveness.
- Implemented multi-threaded ROS framework integrating real-time surface normal estimation using point cloud processing for tool reorientation and complete coverage of complex 3D surfaces.

June – September 2024 **University of Naples Federico II – PRISMA, B2R Lab.:**
Supervisors: Asst. Prof. Fanny Ficuciello & Asst. Prof. Mohammed Gohari

- Designed, 3D printed, and assembled Hand Exoskeleton with a four-bar linkage system using SolidWorks; developed hardware for EMG-based control.
- Control/modeling/simulation in MATLAB / Simulink
- Implemented Machine Learning algorithms, to classify hand states through EMG data; Integrated the algorithms for real-time actuation of hand exoskeleton.
- Assisted an exoglove project's hardware part with twisted string actuators.

July - August 2019

Saha Information Technologies:

- Interned in Test Automation department.
- Engaged in developing and optimizing test scripts, utilized from Java**.**

July - August 2018

Özyeğin University - Biomechatronics Lab.:

- Interned, focused on Upper Body Exoskeleton.
- Collaborated with team to develop electronics and software for assistive robotic devices and to enhance exoskeleton functionality and performance.

COURSE PROJECTS

2024 - 2025 (Fall-Spring)

Sabancı University, Graduation Project (ENS491/492):
Project Supervisors: Prof. Volkan Patoğlu & Prof. Esra Erdem

- Developing an algorithm using Bayesian Optimization with transfer learning for sequential object placement and rearrangement with collision-free arrangements on cluttered surfaces.

2024 - 2025 (Fall)

Sabancı University, Deep Learning for Robot Control (ME 58006):
Course Instructor: Asst. Prof. Aykut Cihan Satıcı

- Developed a data-driven system identification framework for the Cart-Pole system, utilizing JAX, Diffrax, and Optax to estimate system parameters and analyze motion trajectories.
- Implemented a neural network-based controller to perform Cart-Pole swing-up and stabilization, optimizing trajectory costs and comparing performance with LQR control.
- Engineered a Mixture-of-Experts controller, integrating state-dependent switching for autonomous robotic motion control, improving stability.

2024 - 2025 (Fall)

Sabancı University, Kinematics and Dynamics of Machines (EE 521):
Course Instructor: Prof. Volkan Patoğlu

- Developed a MATLAB-based dynamic simulation for a 3RRP Mechanism and a Linear Delta Mechanism, implementing forward/inverse kinematics, Jacobian-based motion analysis, and Baumgarte-stabilized integration for constraint handling.
- Formulated and derived equations of motion using Kane's Method and Lagrange's Equations, analyzing workspace, and singular configurations.

2024 - 2025 (Fall)

Sabancı University, Vision Based Control (EE 529):
Course Instructor: Prof. Dr. Mustafa Ünel

- Implemented vision-based robotic control systems, leveraging image based (IBVS) and position based (PBVS) visual servoing for robotic manipulation.
- Developed and calibrated a camera system, applying feature extraction and homography estimation for precise object tracking.
- Analyzed system stability and convergence using Lyapunov stability theory, ensuring robust and accurate visual servo control in a simulated environment.

2023 - 2024 (Spring)

Sabancı University, Introduction to Robotics (ME 403):
Course Instructor: Prof. Dr. Volkan Patoğlu

- Engineered 3-DoF manipulator with optimized kinematic analysis.
- Implemented Matlab/Simulink for dynamic control and analysis.
- Designed robust controllers, and enhanced trajectory following.

2023 - 2024 (Fall)

Sabancı University, Autonomous Mobile Robotics (ME 425):
Course Instructor: Prof. Dr. Mustafa Ünel

- Implemented odometry and motion control on EV3 LEGO robots.
- Developed range finder sensor and estimated collision time.
- Applied Kalman Filter and Potential Field Path Planning.

2023 - 2024 (Fall)

Sabancı University, Machine Learning (CS 412):
Course Instructor: Asst. Prof. Onur Varol

- Studied ML techniques including SVM, CNN, and neural networks.
- Explored classifier combinations, clustering, and regression methods.
- Developed a model predicting student grades from ChatGPT interactions.

2022 - 2023 (Fall)

Sabancı University, Computational Biology (ENS 210):
Course Instructor: Asst. Prof. Dr. Ogün Adebali

- Analyzed VUSs in mutated BCS1L gene using BLASTp and MEGA11.
- Utilized FigTree and gnomAD for genetic variation assessment.
- Developed Python code for amino acid conservation scoring and diagnosis.

AWARDS and COMPETITIONS

2018 First Robotics Competition (FRC) (Team Cymurghs #7466):

- Innovation in Control award.

2018 World Robot Olympiad (WRO):

- Philippines: Regular category Quarter Final
- Turkey: 2nd prize in the regular category.

2018 Road to VEX (Mechaton):

- "Competition 3rd Prize"
- "Engineering Design 1st Prize

2017 First Lego League (FLL):

- Awarded 2nd Prize; qualified for National Tournament.

SKILLS

- Franka Emika Panda Robot / ROS
- MATLAB / Simulink
- Java / C++/ Python
- SolidWorks
- LTSpice
- Autolev
- Force-Impedance Control
- Independent & Continuous Learner
- Proactive & Self-Motivated

LANGUAGE

- English (Intermediate)
- Turkish (Native)

REFERENCES

- Prof. Volkan PATOĞLU; Sabancı University, Faculty of Engineering and Natural Sciences, Human Machine Interaction Laboratory and Cognitive Robotics Laboratory, Istanbul, Turkey; volkan.patoglu@sabanciuniv.edu
- Prof. Mustafa ÜNEL; Sabancı University, Faculty of Engineering and Natural Sciences, Control, Vision and Robotics (CVR) Research Laboratory, Istanbul, Turkey; munel@sabanciuniv.edu
- Dr. Kübra KARACAN; Technical University of Munich (TUM), Munich Institute of Robotics and Machine Intelligence (MIRMI) AI Robot Safety and Performance Center, Munich, Germany; kuebra.karacan@tum.de
- Asst. Prof. Mohammad GOHARI, Università degli Studi di Napoli "Federico II", Dept. Of Electrical Engineering and Information Technologies, PRISMA Laboratory, Naples, ITALY; mohammad.gohari@unina.it