Ozgur Ege Aydogan

Fulbright PhD Scholar (Fully Funded), 2026 Cohort

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Portfolio Website | LinkedIn

EDUCATION

Osaka University   Osaka, Japan
MS in Robotics Engineering | **GPA:** 3.78/4.00   Sept. 2023
- **Scholarship:** Japanese Government (Monbukagakusho: MEXT, full merit-based)
- Thesis: "*Biomechanically-Informed Adaptive Control of a Muscle-Mimetic Legged Robot for Bio-inspired Locomotion*" (Advisor: Prof. Kensuke Harada)

Yildiz Technical University   Istanbul, Turkey
BS in Mechatronics Engineering | **Graduated with Honors**   July 2020
- Thesis: "*Design and EMG-Informed Impedance Control of a 4-DOF Upper-Limb Exoskeleton for Stroke Rehabilitation and Personalized Motor Assistance*" (Advisor: Prof. Erhan Akdogan)

RESEARCH EXPERIENCE

ATR Research Institute, Hiroshi Ishiguro Laboratories   Kyoto, Japan
Robotics Research Engineer – Advisor: Dr. Hidenobu Sumioka   Sept. 2025 – present
- Developed a real-time human-in-the-loop teleoperation and impedance control framework for a wearable robot, using EMG-informed intent estimation and task-phase adaptation; applied reinforcement learning principles to personalize joint-level torque assistance, improving motor support accuracy by 18%
- Engineered a multimodal sensor fusion pipeline integrating EMG, IMU, and torque data; applied reinforcement learning strategies to modulate impedance parameters, reducing inter-sensor jitter by 22%

Osaka University, Yanagisawa Lab   Osaka, Japan
Robotics Research Assistant – Advisor: Prof. Takufumi Yanagisawa   Nov. 2023 – July 2025
- Developed a control system for a 7-DOF robotic arm, integrating task-phase segmentation and SVM classification to decode motor intent with 75% accuracy and 1.2 s latency during reach-and-grasp tasks
- Engineered a shared-control framework for dexterous assistance, combining torque adaptation with proprioceptive signal processing; improved grasp success by 30% during user-in-loop stroke rehabilitation

Osaka University, Adaptive Robotics Lab (Hosoda Lab)   Osaka, Japan
Graduate Research Assistant – Advisor: Prof. Koh Hosoda   Oct. 2021 – Sept. 2023
- Developed a muscle-mimetic quadruped robot with 30 McKibben-type pneumatic muscles; boosted speed by 80% and stability by 25% via phase-synchronized torque control and adaptive gait strategies
- Designed a compliant actuation and sensing framework using pressure feedback and IMU-informed joint-phase estimation; improved force tracking by 30% and reduced energy use by 18% across variable terrains

Yildiz Technical University, Biomechatronics Research Lab   Istanbul, Turkey
Post-Baccalaureate Research Assistant – Advisor: Prof. Erhan Akdogan   Mar. – Sept. 2021
- Led development of a 5-DOF wearable upper-limb exoskeleton with impedance control modulated by force and EMG, achieving 95% improved responsiveness and 56% reduction in actuation effort
- Engineered a low-cost EMG interface with real-time signal processing for human-in-the-loop torque adaptation, enhancing motor intent decoding by 20% and improving control signal fidelity by 15 dB
- Designed and validated an anthropometrically adaptive frame (4'11"–6'7") with passive load-suspension, reducing user-applied effort by 30% and enabling long-duration ergonomic wearability

Undergraduate Research Assistant – Advisor: Prof. Erhan Akdogan   Sept. 2019 – July 2020
- Led development of a 4-DOF EMG-driven upper-limb exoskeleton with impedance control, achieving 95% joint trajectory fidelity for post-stroke rehabilitation across passive, isometric, and isotonic modes
- Designed a wearable EMG acquisition and control system with Simulink-based impedance tuning, reducing intent-to-torque latency by 18% through integrated joint torque control

JOURNAL PUBLICATIONS

1. Dikbas, F. E. H. M., **Aydogan, O. E.**, Aydin, I., Cetin, D., Aktan, M. E., & Akdogan, E. (2023). Development of a 5-DOF impedance-controlled wearable upper limb exoskeletal robot. Journal of Mechanics in Medicine and Biology. July 15, 2023. https://doi.org/10.1142/S0219519423500574

2. Karadeniz, F., **Aydogan, O. E.**, Kazanci, E. A., & Akdogan, E. (2020). Design of a 4-DOF grounded exoskeletal robot for shoulder and elbow rehabilitation. Sustainable Engineering and Innovation, 2(1), 41–65. July 6, 2020. https://doi.org/10.37868/sei.v2i1.106

CONFERENCE PRESENTATIONS

1. **Aydogan, O. E.*,** Ding, C., Dossa, R. F. J., Arulkumaran, K., Yanagisawa, T., "Closed-Loop EEG-Based BMI for Real-Time Assistive Robotic Arm Control via Motor Intent Decoding," 12th IEEE EMBS Conference on Neural Engineering (NER 2025), San Diego, US, November 2025 (Forthcoming)

2. **Aydogan, O. E.***, Changhao, D., Yanagisawa, T., " Real-Time EEG-Based Brain–Machine Interface for Volitional Robotic Arm Control*,*" Poster presentation, 1st International Symposium on Decoded Neurofeedback (DecNef 2025), Nara, Japan, July 2025

3. **Aydogan, O. E.**, " Domain Adaptation Strategies for Robust and Generalizable Motor Intent Decoding in Assistive BMI Systems," 2024 IEEE EMBS SAC Summer Camp, September 2024

HONORS, AWARDS & RESEARCH GRANTS

1. **Fulbright PhD Scholarship,** U.S. Department of State & Turkish Fulbright Commission, Sole awardee in Mechanical Engineering from Turkey (1–2% acceptance rate, 2026 Cohort)

2. **Japanese Government MEXT Scholarship,** Master's Research, Ministry of Education, Japan (2–5% acceptance rate, October 2021 – September 2023)

3. **One of four students selected internationally,** Osaka University Special Training Program for Robotics Engineers for the Post-Corona Society, January 2021

4. **1st Prize (among 1250 projects)**, TEKNOFEST Aerospace and Technology Festival 2020, Technology for Humanity Competition, Health and First Aid Category, September 2020

5. **2nd Prize (among 540 projects)**, TUBITAK 2242 University Research Projects Competitions, Health Category, The Scientific and Technological Research Council of Turkey, September 2020

6. **TUBITAK 2209-B Research Grant**, Scientific and Technological Research Council of Turkey, Industry-Oriented Undergraduate Grant, ~6% acceptance, January –September 2020

TEACHING & MENTORSHIP EXPERIENCE

Teaching Assistant, Neuromatch Academy, "Deep Learning" course   July 2023 & July 2025
- Mentored 24 PhD students applying CNNs, Transformers, and Reinforcement Learning to motor intent decoding and proprioceptive feedback adaptation for intelligent assistive systems

Research Mentor, IEEE EMBS SAC Student Mentoring Program 2024   Aug. 2024 – Feb. 2025
- Mentored a PhD student developing a bioadaptive upper-limb prosthesis using sEMG and capacitive tactile sensing; guided real-time motor intent decoding and task-adaptive torque control

TECHNICAL SKILLS

- **Dexterous Manipulation & Robot Control:** Grasp planning, multi-finger manipulation, frictional contact modeling, compliant grasp strategies, inverse dynamics, joint torque estimation, task-phase segmentation, simulation-to-reality transfer, Simulink, ROS2, Gazebo, OpenSim

- **Machine Learning for Assistive Systems:** Reinforcement learning, CNN models, proprioceptive feedback adaptation, policy optimization, sensor fusion, Python, PyTorch, scikit-learn, NumPy

- **Tactile Sensing & Wearable Robotics:** Capacitive tactile sensors, sEMG decoding, IMUs, sensorized robotic hands, embedded C++, Arduino, SolidWorks, teleoperation interfaces, human–robot interaction

- **Language:** English (Advanced, IELTS Academic: 7.5), Turkish (Native), Japanese (Intermediate)

PROFESSIONAL MEMBERSHIPS

- IEEE Robotics and Automation Society (RAS)   Apr. 2023 – present
- IEEE Engineering in Medicine and Biology Society (EMBS)   Apr. 2023 – present