

Yunus Terzioglu, CV

Research Vision |

My research focus is on *transfer* and *meta-learning* with the overarching goal of effective *robot learning from demonstrations*, enabling robots to *adapt* to complex tasks much more efficiently. My line of work draws its original inspiration from the schemas in Piaget's cognitive development theory in *lifelong learning* settings. I am aiming to extend transfer learning methodology and merge it with the *human-robot interaction* and *collaboration* practices, effectively addressing some of many problems the field of *social robotics* currently suffers from regarding *robot deployment*.

Education

- 2019 -** Northeastern University, Ph.D. Candidate in Khoury College of Computer Sciences
- Ongoing research on Deep Reinforcement Learning and Human-Robot Interaction
 - GPA: 4.0 / 4.0
 - Advisor / Co-advisor: Robert Platt / Timothy Bickmore
- 2017 - 2019** Middle East Technical University (METU), Ph.D. Studies in Computer Engineering Department – Continued Ph.D. studies in the USA
- Research on Human-Robot Interaction/Collaboration
 - GPA: 3.75 / 4.0
 - Advisor: Erol Şahin
- 2015 - 2017** Middle East Technical University (METU), Ph.D. Candidate in Electrical and Electronics Engineering – Dropped at own will to change research field
- Intended to focus on Control Strategies for Robotic Systems
 - GPA: - / 4.0
 - Advisor: Tayfun Akın
- 2012 -2015** Middle East Technical University (METU), M.S. in Electrical and Electronics Engineering
- Thesis: [High Performance Closed-Loop Analog Readout Circuit for Capacitive MEMS Accelerometers](#)
 - GPA: 3.57 / 4.0
 - Advisor: Tayfun Akın
- 2007 -2012** Middle East Technical University (METU), B.S. in Electrical and Electronics Engineering
- GPA: 2.93 / 4.0

Research Experience

- 2019 –** PhD Researcher in Robotics, Northeastern University Khoury College of Computer Sciences – Boston, MA/USA
- Reinforcement Learning
 - Human-Robot Interaction
 - Transfer Learning

2016 – 2019 **PhD Researcher** in Robotics, Middle East Technical University Kovan Research Laboratory – Ankara/Turkey

- Human-Robot Interaction, Human-Robot Collaboration
- User Studies and Statistical Methods
- Deep Learning
- Developmental Psychology

2016 **Visiting Researcher** (Sep. to Dec.), Massachusetts Institute of Technology Laboratory for Information & Decision Systems (MIT-LIDS), Sertac Karaman's Group – Boston, MA/USA

- Navigation, Autonomous Drones, Agile Flight
- IMU interface development in C++ on Jetson TX2

2012 – 2015 **Masters' Research**, Inertial Measurement Systems, Middle East Technical University MEMS Research and Applications Center (METU-MEMS) – Ankara/Turkey

- Micromechanical accelerometer and closed-loop capacitive readout circuit design
- Automation of the characterization test setups for micro-accelerometers
- Measurement-based post-fabrication characterization of capacitive micro-sensors

Work Experience

2019 – **Research Assistant**, Northeastern University Khoury College of Computer Sciences – Boston, MA/USA
(current)

- Reinforcement Learning, Robotics, Human-Robot Interaction
- R&D using Python and ML libraries on simulated agents and SoftBank's Pepper

2019 **Technical Consultant**, Proven Information Technologies Co. Ltd. – Ankara/Turkey
(6 months)

- Robot-assisted test systems
- Assistance on kinematics, ROS, Python/C++ programming, deployment

2019 **Technical Consultant**, Levitate Stage Innovations – Ankara/Turkey
(1 month)

- Drone systems design, feasibility studies

2017 – 2019 **Researcher**, METU Kovan Research Laboratory – Ankara/Turkey

- Safe Human-Robot Collaboration on the Factory Floor
- Collaborative Furniture Assembly
- R&D using ROS, C++ on Universal Robots UR5 and IIT iCub

2012 – 2016 **Scientific Project Expert**, METU-MEMS Research and Applications Center, Inertial Measurement Units Group – Ankara/Turkey

- High Performance Closed-Loop Accelerometers
- Signal processing, MATLAB modeling, MEMS/VLSI/PCB design and fabrication

2012 **Part Time Engineer**, ASELSAN, Microelectronics Group – Ankara/Turkey
(7 months)

- Embedded Test and Characterization Systems Design

2011 **Intern**, ASELSAN, Microelectronics Group – Ankara/Turkey
(1 month)

- Embedded Test and Characterization Systems Design

2010 **Intern**, Czech Technical University – Prague/Czech Republic
(1 month)

- Procedure development for shielding efficiency characterization of carbon-composite textiles

Teaching Experience

- 2020 CS5100 Foundations of Artificial Intelligence, Teaching Assistant, Northeastern University
- 2017 CENG585 Fundamentals of Autonomous Robotics, MATLAB Crash Course, METU-CENG
- 2013 EE617 Principles of Analog VLSI Design, Lab Assistant, METU-EEE

Academic Publications

- 2022 **Y. Terzioglu**, P. Murali, E. Kimani, T. Bickmore, “Sharing the Spotlight: Co-presenting with a Humanoid Robot.” **Accepted** for *Proceedings of the 2022 ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, March 2022.
- 2021 T. Bickmore, P. Murali, **Y. Terzioglu**, S. Zhou, “Perceptions of Quantitative and Affective Meaning from Humanoid Robot Hand Gestures.” In *Int’l Conference on Social Robotics*, pp. 386-396, Nov 2021.
- 2021 **Y. Terzioglu**, O. Aslan, B. Bolat, B. Bal, T. Tumer, F. C. Kurnaz, S. Kalkan, E. Sahin, “APPRENTICE: Towards a Cobot Helper in Assembly Lines.” *ICRA2021 Workshop on Unlocking the Potential of HRC for Industrial Applications*, June 2021.
- 2020 **Y. Terzioglu**, Bilge Mutlu, and Erol Şahin. “Designing Social Cues for Collaborative Robots: The Role of Gaze and Breathing in Human-Robot Collaboration.” In *Proceedings of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, March 2020.
- 2018 R. T. Sayre-McCord, W. Guerra, A. Antonini, J. Arneberg, A. Brown, G. Cavalheiro, Y. Fang, A. Gorodetsky, D. McCoy, S. Quilter, F. Riether, E. Tal, **Y. Terzioglu**, L. Carlone, and S. Karaman. “Visual-inertial navigation algorithm development using photorealistic camera simulation in the loop.” In *IEEE Int’l. Conf. on Robotics and Automation (ICRA)*, May 2018.
Featured on MIT Tech News: [Link](#)
- 2018 F. C. Kurnaz, **Y. Terzioglu**, S. Buyukgoz, E. Sahin, ROS Tabanlı Bagimsiz Guvenlik Bekcisi Modulu (A ROS-Based Standalone Security Watchdog Module), Turkiye Robotbilim Konferansi (ToRK) (National Conference on Robotics), Istanbul, Turkey, April 2018.
- 2016 T. Kose, **Y. Terzioglu**, K. Azgin, and T. Akin, “A Single-Mass Self-Resonating Closed-Loop Capacitive MEMS Accelerometer,” *IEEE Sensors Conference*, pp. 1-3, Orlando, FL, USA, October 2016.
- 2016 A. Aydemir, **Y. Terzioglu**, and T. Akin, “A New Design and a Fabrication Approach to Realize a High Performance Three Axes Capacitive MEMS Accelerometer,” *Sensors and Actuators A*, April 2016.
- 2015 **Y. Terzioglu**, “High performance closed-loop analog readout circuit for capacitive MEMS accelerometers,” (Master’s Thesis, Middle East Technical University, Ankara/Turkey). Available from [METU Library](#).
- 2015 **Y. Terzioglu**, T. Kose, K. Azgin, and T. Akin, “A Simple Out-of-Plane Capacitive MEMS Accelerometer Utilizing Lateral and Vertical Electrodes for Differential Sensing,” *IEEE Sensors Conference*, pp. 525-527, Busan, South Korea, November 1-4, 2015.
- 2015 T. Kose, **Y. Terzioglu**, K. Azgin, and T. Akin, “A Single Mass Two-Axis Capacitive MEMS Accelerometer with Force Rebalance,” *2015 IEEE Int’l Symposium on Inertial Sensors & Systems (ISISS 2015)*, pp. 1-4, Hapuna Beach, HI, USA, March 23-26 2015.
- 2014 **Y. Terzioglu**, S.E. Alper, K. Azgin, T. Akin, “A capacitive MEMS Accelerometer Readout with Concurrent Detection and Feedback using Discrete Components”, in *IEEE PLANS*, April, 2014.
- 2010 **Y. Terzioglu**, “Scalar Measurement of Electromagnetic Shielding Efficiency of Carbon Textiles”, in *Knowledge in Telecommunication Technologies and Optics (KTTO)*, December 2010.

Selected Academic Projects

- 2020** User studies on sub-optimal robot behaviors and deaxis on HRI (w/ Dr. Tim Bickmore)
- 2018 – 2019** User studies on human-robot interaction (**Published on HRI 2020**)
- 2018** Collaboration Security Watchdog: A standalone ROS-based security watchdog which runs on Raspberry Pi to monitor and secure the human-robot collaboration. (**Published on ToRK 2018**)
- 2017 – 2019** Funded TUBITAK Project: Designing and developing an assistive/collaborative robotic system to work on factory floor in close proximity to humans
- 2015** Design and Implementation of a $5.5 \mu\text{g}/\sqrt{\text{Hz}}$ Closed-Loop MEMS Accelerometer, Master's Thesis Project, Advisor: Tayfun Akin
- 2015** Implementation of Path-Planning Algorithms within the Curriculum, Course: Robot Motion Planning and Control, taught by Uluc Saranli
- 2011 – 2012** An Autonomous Robot that Can Climb a Vertical Wall, Undergraduate Thesis Project, **Best design project award**
- 2012** Designed a 0.6u CMOS rail-to-rail Band-Gap Reference IC with bias stability, Course: Analog Integrated Circuits, taught by Haluk Kulah
- 2011** Designed a 0.6u CMOS Phase Locked Loop locked at 10MHz, Course: Digital Integrated Circuits, taught by Tayfun Akin

Honors / Awards

- 2018** Invited Speaker at Symposium on Human-Robot Interaction at Middle East Technical University Informatics Institute (December 13)
- 2017** European Robotics Week host at Middle East Technical University Kovan Research Laboratory [Link to the event page](#)
- 2013** Worked as a technical advisor and team member in the award winning “Easy Guitar” project in the entrepreneurship competition “Yeni Fikirler Yeni Isler” in Turkey
- 2012** Awarded as the best project in senior students project fair with “An Autonomous Robot that Can Climb a Vertical Wall”
- 2008 – 2010** Listed in METU Honor Roll for 2 semesters
- 2008 – 2009** Listed in METU High Honor Roll for fall semester
- 2007** Ranked 287th among ~2 million students in the National University Entrance Exam
- 2007** Ranked 1st from Antalya Anatolian High School, Turkey

Selected Computer Skills

- ROS
- Python
- C/C++
- PyTorch
- TensorFlow
- MATLAB
- SPSS/JMP
- Linux
- CMake
- Code::Blocks
- SolidWorks
- Eagle CAD
- Cadence
- Verilog
- Agilent Vee
- COMSOL