Yigit Korkmaz

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Research Interests

Robotics & Intelligent Systems, Reinforcement Learning, Imitation Learning, Robot Learning, Robotic Manipulation and Grasping, Human-Robot Interaction, Human-in-the-loop Learning, Path and Motion Planning.

Education

University of Southern California — *Los Angeles, CA*
PhD in Computer Science. — Aug 2023 – Present
- Robotics focus, advised by Asst. Prof. Erdem Biyik

University of California San Diego — *San Diego, CA*
MSc in Electrical and Computer Engineering. **GPA**: 3.96/4.0 — Sep 2021 – Jun 2023
- Intelligent Systems, Robotics and Control track.

Bogazici University — *Istanbul, Turkey*
BSc in Electrical & Electronics Engineering. **GPA**: 3.74/4.0 — Sep 2016 – Feb 2021
Minor in Mechanical Engineering. **GPA**: 3.75/4.0 — Sep 2017 – Feb 2021

Research Experience

Learning and Interactive Robot Autonomy Lab (LiraLab) — Aug 2023 – Present
University of Southern California — *Los Angeles, CA*
Supervisor: Asst. Prof. Erdem Biyik

- Specializing in learning from humans through various modes, including explicit demonstrations and comparisons, as well as implicit cues like gaze and gestures, with the aim of equipping AI agents and robots to understand and align with human goals and preferences.
- Developing algorithms to enhance the cooperation between humans and robots by utilizing multiple modes of information sources to understand, align with, and adapt to human goals and preferences.

Prof. Xiaolong Wang's Research Group — March 2022 – Jun 2023
UC San Diego — *San Diego, CA*
Supervisor:Asst. Prof. Xiaolong Wang

- Worked on Imitation Learning for dexterous manipulation using Allegro hand, where we collect demonstrations by recording videos or using teleoperation from humans to guide dexterous manipulation.
- Mainly took part in the learning side of the project, implementing different Visual Imitation Learning models using transfer learning, end-to-end learning, and auto-encoders along with various training pipelines to create a robust training procedure for collected demonstrations.
- In order to collect demos and test the pipeline, implemented various tasks and environments in the SAPIEN simulator.

Existential Robotics Laboratory — Jun 2022 – Oct 2022
UC San Diego — *San Diego, CA*
Supervisor: Asst. Prof. Nikolay Atanasov

- Analyzing the effects of multimodal observations including pressure sensors on the performance of Reinforcement and Imitation Learning methods, especially in manipulation tasks.
- Implemented overall learning/evaluation pipeline along with different task settings in Robosuite simulator to observe the effect of touch sensors in learning.

Volumetric Analysis & Visualization Group (VAVLab) — Sep 2020 – Aug 2021
Bogazici University — *Istanbul, Turkey*
Supervisor: Prof. Burak Acar

- Worked on Dual Energy X-ray material discrimination, where the main aim is to create an efficient material discrimination and image understanding method to be used in dual energy x-ray detection systems by employing various computer vision and machine learning algorithms.
- Implemented various numerical material discrimination methods and machine learning models to classify pixels. Tested performances of different methods in simulation environments.

Teaching & Other Services

- Teaching Assistant for ECE 276A - Sensing & Estimation in Robotics at UC San Diego
- Teaching Assistant for EE 352 - System Dynamics & Control at Bogazici University

Accomplishments

Scholarships and Fellowships

- Fulbright Master's Grantee (2yr, 2021-2023, $50,000 per year)
- High-School Full Merit Scholarship(5yr, $30,000)

Highlights

- Ranked as 431st/2,086,087 in 2016 OSYS (Turkish equivalent of SAT).
- 2 times 1st/1,070,445 in high-school entrance exams (SBS) in Turkey. 9th/1,070,445 in average of 3 years.
- One of the students in 10% in terms of GPA in EE department in Bogazici University (Average GPA in the department $\leq$3.05)

Work Experience

Robotics Engineer Mar 2021 – Aug 2021
Kodmed *Istanbul, Turkey*

- Designed and built company's first social robot prototype, which can interact with people and its environment.
- Worked on autonomous navigation and mapping using various SLAM algorithms and depth sensors.
- Worked on object detection and tracking by implementing various deep learning models in ROS environment.
- Implemented real time speech recognition module using Speech-to-Text algorithms in the robot to enable voice control.
- Created a human-machine interface to be used in the robot with ROS and visualization tools such as Rviz and Gazebo.

Part Time Artificial Intelligence & Computer Vision Engineer Jul 2020 – Feb 2021
senpai.gg *Istanbul, Turkey*

- Implemented various deep learning models to infer various data from video games.
- Worked on different object detection algorithms in Python to create assisting features for video game players.
- Developed various scripts using openCV, Keras and Tensorflow to improve and evaluate learning models' performance.

Hardware & Embedded Software Engineering Intern Jul 2019 – Sep 2019
Pubinno *Istanbul, Turkey*

- Took part in building of the first prototype for Smart Clean, which is a smart draft beer pipeline cleaner. Achieved 80% more effective cleaning with the designed algorithm.
- Worked mainly in R&D department. Designed and implemented different prototypes of flow control using different boards such as Arduino and Raspberry Pi.
- Designed and built various test devices using PSpice to check the accuracy of the different sensors of Smart Tap, which is company's IoT based beverage tap.

Extracurricular Activities

Lead Robot Inspector & Organization Committee Member May 2015 – Present
Fikret Yuksel Foundation, FIRST Robotics Competition - Turkey *Istanbul, Turkey*

- Organizing off-season and official FIRST robotics competitions for high school students since 2015 in Ulker Sports Arena.
- During competitions, working as Lead Robot Inspector, which requires a certificate to ensure knowledge about mechanics, pneumatic systems, electrical circuits, sensors and programming.

Event Volunteer Jan 2016 – Present
Bilim Kahramanlari, FIRST Lego League - Turkey *Istanbul, Turkey*

- Responsible for coordination of judging, robot matches and projects for students of age 9-16.

CMAS 3-Star Scuba Diver Jan 2017 – Aug 2021
BUSAS - Bogazici University Underwater Sports Club *Istanbul, Turkey*

- Passed required theoretical and practical courses, currenly holding CMAS 3 Star Diver License. Voluntarily working as a member of board of Bogazici University Underwater Sports Club(BUSAS).

Skills & Interests

Related Coursework: Sensing and Estimation in Robotics, Planning and Learning in Robotics, Search and Optimization, Statistical Learning, Robot Learning, Computer Vision, Neural Networks and Pattern Recognition, System Dynamics and Control, Stochastic Processes, Signals and Systems, Digital Control.
Languages: Python, Matlab, C/C++, Bash, SPICE.
Frameworks: PyTorch, Tensorflow, Keras, Numpy, Scikit Learn, OpenCV, ROS.
Interests: Scuba diving, freediving, surfing, basketball, volunteering, calisthenics.