

Bengisu Güresti

Curriculum Vitae

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I am interested in deep reinforcement learning, multi-agent systems and meta-gradient learning. I am currently a Research & Teaching Assistant at Istanbul Technical University and my research is on mechanism design using meta-gradients for resolving sequential social dilemmas. I wish to continue my education with a PhD in this field. I wish to build a research-oriented career.

EDUCATION

- February 2020 – **Computer Engineering (MSc)**, *Istanbul Technical University*, Istanbul, TURKEY.
 - Present Focus: Multi-agent Reinforcement Learning
Current GPA: 4.0/4.0
- September 2016 – October 2020 **Electronics and Communication Engineering (BSc, Double Major)**, *Istanbul Technical University*, Istanbul, TURKEY.
 - 2020 GPA: 3.62/4.0
Bachelor Thesis: Hardware Implementation of Artificial Neural Networks,
Advisor: Assoc. Prof. Mustafa Altun
- September 2015 – January 2020 **Computer Engineering (BSc)**, *Istanbul Technical University*, Istanbul, TURKEY.
 - 2020 GPA: 3.72/4.0
Bachelor Thesis: Robotic Manipulation with Deep Reinforcement Learning,
Advisor: Assoc. Prof. Sanem Sariel
- August 2018 – February 2019 **Communication Systems (Erasmus Program)**, *École Polytechnique Fédérale de Lausanne*, Lausanne, SWITZERLAND.
- September 2010 – June 2015 **Kabatas Erkek Lisesi (Anatolian High School)**, *Concentration: Math-Science*, Istanbul, TURKEY.
 - Primary foreign language: German

AWARDS & SCHOLARSHIPS

- DeepMind Scholar at Istanbul Technical University Computer Engineering MSc program
- Selected as Principal Nominee for **Fulbright PhD Scholarship** for 2020-2021 academic year
- Prime Ministry Scholarship** (for the rank of first 100 – 7th in DIL-2 – in LYS 2016, i.e. Turkish Undergraduate Placement Examination)
- Is Bankasi **Golden Youth Prize**

RESEARCH EXPERIENCE

- April 2020 – Present **Graduate Researcher**, *Istanbul Technical University*, Artificial Intelligence and Data Science Research Center, Assoc. Prof. Nazim Kemal Üre.
 - Deep Reinforcement Learning methods on increasing collaboration in multi-agent systems by learning sparse interaction graphs using self attention mechanism and graph networks for more efficient communication and collaboration.
 - Investigating transfer capability of centralized training decentralized execution paradigm across variable number of agents.
 - Agent incentivization in Sequential Social Dilemmas with meta-gradients.

- June 2019 - **Undergraduate Researcher**, *Istanbul Technical University*, Artificial Intelligence and Robotics Laboratory, Assoc. Prof. Sanem Sariel.
- March 2020
 - Implementation of Soft Actor Critic (SAC), Training Baxter robot arm using Pybullet Simulation Environment to reach a target point, push an object and grasp an object with DDPG, SAC and Hindsight Experience Replay
- April 2018 - **TUBITAK Project Undergraduate Student Scholar**, *Istanbul Technical University*, Artificial Intelligence and Robotics Laboratory, Assoc. Prof. Sanem Sariel.
- June 2018
 - Work on Violet (Visual Interpreter and Modeller for Objects and Relations), programming of some relations between objects, Implementation of Kalman filter for vision tracking

PEER-REVIEWED WORKSHOP PAPERS

Guresti, B., Ure, N. K., (2021). Evaluating Generalization and Transfer Capacity of Multi-Agent Reinforcement Learning Across Variable Number of Agents. Presented in AAAI Spring Symposium on Challenges and Opportunities for Multi-Agent Reinforcement Learning (COMARL)

TEACHING EXPERIENCE

- 2021-2022 Fall
 - **Teaching Assistant - Machine Learning (MSc Level)**, *Istanbul Technical University*, Istanbul, TURKEY.
(Ongoing) Prepared 2 homework and 1 course project, graded 1 homework
- 2021-2022 Fall
 - **Teaching Assistant - Software Engineering (Undergraduate Level)**, *Istanbul Technical University*, Istanbul, TURKEY.
(ongoing) Graded 1 homework on Requirement Specification documentation
Had 5 meetings with 9 project groups to play the role of customer and supervise projects
- 2020-2021 Fall
 - **Teaching Assistant (Volunteer) - Deep Learning (MSc Level)**, *Istanbul Technical University*, Istanbul, TURKEY.
Prepared and graded Recurrent Neural Network with Numpy custom backpropagation and with PyTorch for language modelling homework

WORK EXPERIENCE

- December 2021 - Present
 - **Research and Teaching Assistant**, *Istanbul Technical University*, Istanbul, TURKEY.
- July 2018 - August 2018
 - **Digital Design and Signal Processing Intern**, *ASELSAN*, Ankara, TURKEY.
Component design of an NTSC video encoder using VHDL
Intensity control of a LED using PWM on a Zc706 Evaluation Kit with VHDL
- June 2018–July 2018
 - **Software Engineering Intern**, *SIEMENS*, Istanbul, TURKEY.
Large customer data file generation for performance test of Spectrum Power 7 by shell scripting
Implementation of automated test using Selenium WebDriver

LANGUAGES

- Turkish: Native
- English: C1
- German: C1
- French: A2/B1

CERTIFICATIONS & TEST SCORES

- TOEFL IBT
 - **Score: 105**, *Istanbul, TURKEY*, August 2021.
Home Edition
- GRE General
 - **Verbal Reasoning: 157, Quantitative Reasoning: 166, Analytical Writing: 4.0**, *Istanbul, TURKEY*, October 2019.

DSD-II **C1**, *Istanbul, TURKEY*, May 2015.

- Deutsches Sprachdiplom

TECHNICAL SKILLS

- Python, PyTorch, Jax, Flax, Pandas, C, C++, Java, MATLAB, Pandas, \LaTeX , VHDL, Verilog
- Deep Learning, Deep Reinforcement Learning, Multi-agent Systems, Game Theory, Signal Processing, Image Processing, Data Analysis