

Bengisu Güresti

Curriculum Vitae

Sarıyer/Istanbul, 34398, Turkey

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📄 <https://bengisug.github.io>

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.
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- 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 - **Digital Design and Signal Processing Intern**, *ASELSAN*, Ankara, TURKEY.
- August 2018 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