GUVEN GERGERLI

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My research focuses on developing explainable AI systems through hybrid uncertainty-aware models that integrate Bayesian reasoning, LLMs, and multi-agent reinforcement learning, applying Theory of Mind to enable transparent decision-making in dynamic environments.

EDUCATION

Purdue University

PhD Student in Computer Science • Advisor: Joseph Campbell

Bilkent University

BS in Computer Science

WORK EXPERIENCE

CAMP Lab at Purdue University

Research Assistant

- Developing an uncertainty-based Theory of Mind agent model to capture causal effects in a white-box design for long-horizon learning and reasoning on multi-agent environments
- Developing a method to infer coactivated and sparse agent intentions using offline reinforcement learning and a decomposed reward function for behavior prediction.

Qatar Computing Research Institute

Visiting Researcher

• Optimized protein crystallization object detection through data augmentation and hyperparameter tuning and published a web application for protein crystallization object detection.

Human Agent Interactions Lab at Purdue University

 $Research \ Assistant$

• Developed and tested robot interfaces to utilize physical robots as a novel automated medical speech therapy for elders suffering from aphasia.

Turkish Airlines Technology

Machine Learning Intern

- Developed an ANN model to estimate annual income using a Turkish Airlines flights and revenues dataset.
- Visualized the estimated annual income on a regression graph to represent monthly and daily predicted income.

Vela Partners

Machine Learning Intern

• Fine-tuned a BERT-based model to compute semantic similarity across a large enterprise dataset for a k-NN-based classification.

ESEN Integration System

Software Engineer Intern

- Developed a Python program to filter and optimize black box transmission messages for defense industry aircraft.
- Produced an HTML-based UI for data visualization of filtered transmission messages designed for mechanical engineers.

AirCar Corp.

Machine Learning Intern

- Fine-tuned object detection algorithms for top-view terrain analysis in drone emergency landing scenarios.
- Published a drone-view RGB terrain dataset using for fine-tuning object detection algorithms for emergency landing.

PUBLICATIONS

Bayesian Social Deduction with Graph-Informed Language Models. Shahab Rahimirad^{*}, **Guven Gergerli^{*}**, Lucia Romero, Angela Qian, Matthew Lyle Olson, Simon Stepputtis, Joseph Campbell (2025) In submission for NeurIPS 2025. *equal contribution

SKILLS

- Languages: Turkish (Native), English (Professional)
- Programming Languages: Python, Java, C, C#, C++, JavaScript, MatLab, PHP, HTML, CSS, SQL
- Tools & Frameworks: Pytorch, Keras, Git, GitHub, React.js, Node.js, MongoDB, Firebase, MariaDB, Firebase, JQuery, Linux, Android Studio, MySQL, PostgreSQL, Docker
- Software Engineering Skills: ML, NLP, RL, AI, LLM Foundation Models, LLM Fine Tuning, Data science, OOP, Agile Development & Scrum, Data Structures, Requirements Engineering, Algorithm Design

West Lafayette, IN Sep 2018 – June 2023

Ankara, Turkey

August 2023 - Present

July 2024 – Present West Lafayette, IN

May 2024 – July 2024

Aug 2023 – May 2024

West Lafayette, IN

Doha, Qatar

Aug 2022 – Sep 2022

Istanbul, Turkey

July 2022 – Aug 2022

San Francisco, CA

June 2021 – Aug 2021

Ankara, Turkey

July 2020 – Aug 2020

Istanbul, Turkey