CAGAN BAKIRCI

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RESEARCH FOCUS

Robot learning for real-world deployment: safety-constrained RL and uncertainty-aware interventions for vision–language–action robot policies.

EDUCATION

University of Southern California **August 2024–Present**

Master of Science in Computer Science - Artificial Intelligence

Notable Coursework

- CSCI 561 - Foundations of Artificial Intelligence
- CSCI 567 - Machine Learning
- CSCI 566 - Deep Learning and Its Applications
- CSCI 570 - Analysis of Algorithms
- CSCI 544 - Applied Natural Language Processing

Planned (Spring 2026): CSCI 659 – Introduction to Online Optimization

University of California Santa Cruz **March 2020**

Bachelor of Science in Computer Science with Honors

Notable Coursework

- CMPS 242 - Machine Learning (Graduate level)
- CSE 244 - Machine Learning for NLP (Graduate level)
- CSE 140 - Artificial Intelligence

SKILLS

ML/Robotics: PyTorch, JAX, TensorFlow/Keras, NumPy/SciPy, scikit-learn, Gymnasium, ManiSkill, SimplerEnv
Systems: Linux, SLURM, Apptainer/Docker, Git, Bash
Backend/Web: Spring Boot, Django, Eclipse Vert.x, SAP Hybris, Angular, Node.js
Mobile: Android/Kotlin, Jetpack Compose
Languages: Python, C/C++, Java, Kotlin, SQL

RESEARCH EXPERIENCE

Graduate Researcher - CPS-Vida Lab, Robotics & RL Team, **January 2025–Present**
Advisor: Prof. Jyotirmoy Deshmukh

University of Southern California, Los Angeles, CA

- Developing uncertainty-triggered intervention methods for VLA robot policies; exploring diverse statistical approaches (distributional, geometric, manifold-based) for failure detection; building robust and reproducible pipelines
- Stabilized and evaluated reward shaping approaches for PRIMAL/PICO-style decentralized multi-agent path finding across varying environment complexities

Graduate Researcher - Lira Lab, Robot Learning & Safety RL, **September 2025–Present**
Advisor: Prof. Erdem Biyik

University of Southern California, Los Angeles, CA

- Developing safety-aware reinforcement learning methods for robotic manipulation with early results demonstrating improvements over human-in-the-loop baselines
- Implementing and evaluating approaches in customized simulated manipulation environments (ManiSkill)

PROFESSIONAL EXPERIENCE

SENIOR MACHINE LEARNING SOFTWARE ENGINEER **June 2021–July 2024**

BEKO/ARCELIK Global, ISTANBUL, TURKEY

- Promoted to Senior in two years (fastest timeline permitted by company policy)
- Founder & Lead of ComMind - Spearheaded the ComMind initiative, introducing a revolutionary rating system featuring a dynamic, self-correcting algorithm and machine learning models. Project gained recognition from Sabanci University, fostering a collaboration with Professor Anil Koyuncu and securing a place within Koc University's incubation hub for commercial development
- Co-Founder & Developer of the Search Helper Project - Conceptualized and spearheaded development of a scalable, containerized microservice for string matching, automatically correcting over 210,000 search query typos in its first month, boosting search reliability by 89% and enhancing online sales through improved in-site search
- Founder & Lead of Oculus - Launched and led development of Oculus Project, employing computer vision to automate reading of stock and serial numbers on Arcelik products
- Backend Developer for Digital Commerce Solutions - Implemented features on SAP Hybris Commerce using Java and Spring Boot
- Technical Lead of Arcelik DropShipment - Architected and led implementation of DropShipment project at Arcelik, implemented key features such as fulfillment module, enhancing operational efficiency and service delivery
- Organizer/IT Owner of the Arcelik Personnel Website - Constructed and orchestrated multiple teams to create a productive work environment, leading to dramatic improvements of user experience on Arcelik personnel website

SOFTWARE ENGINEER **August 2020–June 2021**

FAIRBIT LLC, ORANGE, CALIFORNIA

- Developed asynchronous, reactive microservices using Eclipse Vert.x in Java 15, with PostgreSQL for data storage, improving system reliability

SELECTED PROJECTS

Decoding Thoughts, Refining Words: EEG-to-Text Meets LLMs **September 2025–December 2025**

Researcher, Los Angeles, CA

- Optimized EEG-to-text decoding via beam search tuning and no-repeat n-gram constraints, improving non-teacher-forced BLEU-1 by 32% (relative) on ZuCo V1; explored external and context-aware LLM re-scoring.

Reconstructing Sound From Brain Responses To Music Stimuli **August 2024–December 2024**

Researcher, Los Angeles, CA

- Reconstructed music stimuli from EEG by mapping PSD features to mel-spectrograms; achieved 82.86% classifier accuracy and 0.80 cosine similarity, surpassing the EEG2Mel CNN baseline (80.80%).

WikiTrust 2.0 **October 2019–January 2020**

Algorithm/Research Team Lead, Santa Cruz, CA
Advisor: *Prof. Luca De Alfaro*

- Led the Algorithm/Research team in development of WikiTrust 2.0; an open-source, online reputation system for Wikipedia authors and content

Earthquake Prediction **April 2019–June 2019**

Researcher, Santa Cruz, CA

- Designed ML models to predict earthquake time-to-failure from real-time seismic data, achieving a top 5% rank in LANL's Kaggle competition.