Eda Bayram

Dublin, Ireland

CONTACT
INFORMATION

E-mail: eda.bayram@ucdconnect.ie
Homepage: bayrameda.github.io

PROFESSIONAL
SUMMARY

AI Researcher with PhD in computer science and +10 years of research and engineering experience in both academic and industry settings. Passionate about research in cognitive science.

Proven expertise in implementation of ML models with a strong focus on graph machine learning, knowledge graph reasoning, and explainable AI. Skilled in Python and DL frameworks (PyTorch, TensorFlow) with git and issue tracking systems.

Experienced in designing GenAI assistants, context-aware LLM reasoning with prompt engineering, RAG, fine-tuning with LLM frameworks.

Languages: Turkish (native), English (fluent), French (B1), German (A2)

CliftonStrengths: Discipline | Learner | Input | Relator | Intellection

EDUCATION

NOV 2025 -
SEP 2023
(Part Time)

MSc, COGNITIVE SCIENCES
University College Dublin (UCD), Ireland

- Course work and projects in the cross-disciplinary field of psychology, neuroscience, linguistics, philosophy and artifical intelligence,

- Essays on neuropsychological cases on perception and action, enactive social cognition, dissociative theory of consciousness: access vs phenomenal consciousness, phenomenalism vs illusionism.

DEC 2021 -
APR 2017

PhD, COMPUTER SCIENCE
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

- Research projects on *Graph Representation Learning*, *Knowledge Graph Completion*, *Statistical Inference with Graphical Models*, *Graph Signal Processing*,

- Teaching assistant in courses *Digital Signal Processing*, *Network Data Science*,

- Supervision of master students' semester projects in *Graph Signal Processing*, *Graph Representation Learning*,

- Courses: *Optimization for Machine Learning*, *Computational Optimal Transport*, *Network Data Science*, *Teaching Science Engineering*,

- Thesis study: *Representation Learning on Multi-relational Data*, Advisor: Prof. Pierre Vandergheynst.

FEB 2017 -
SEP 2014

MSc, ELECTRICAL AND ELECTRONICS ENGINEERING (Honor Student)
Middle East Technical University (METU), Turkey

- Specialization on adaptive signal processing with courseworks on linear algebra, optimization, machine learning, computer vision and image processing

- Thesis study on exploitation of spectral graph theory and graph signal processing frameworks for the analysis of 3D LiDAR point clouds under co-supervision of Prof. Aydın Alatan and Prof. Elif Vural.

JUN 2013 -
SEP 2009

BSc, ELECTRICAL AND ELECTRONICS ENGINEERING (Honor Student)
Middle East Technical University (METU), Turkey

- Senior year specialization on telecommunications and signal processing

- Graduation project: Interior route-finding, wearable assistive device for visual-defective people

Employment

Present - Nov 2024	**AI Researcher** **Huawei Ireland Research Center, Dublin**, Ireland • At Smart Network Innovation (SNI) Lab, researched and engineered AI models for digital twin technology in the telecom industry, covering wireless, optical fiber, and IP networks. • Developed and evaluated generative models for synthetic data generation and simulation of real-world network events. • Investigated world models (action-conditioned generative models) and physics-informed neural networks for applications in physical AI. • Explored digital twin–AI agent interactions to improve simulation fidelity, scalability, and adaptability. • Designed and deployed interactive prototype web applications using Streamlit, enabling stakeholders to visualize, test, and validate AI-driven simulations in real time.
Oct 2024 - Feb 2022	**AI Researcher** **Accenture Labs, Dublin**, Ireland • Research in graph ML and explainable AI in biomedical applications with university collaborations towards paper submissions to machine learning and data mining conferences • Implementation of code base, proof of concept and prototypes for query answering systems on biomedical databases, knowledge graph embedding learning for multi-hop link prediction • Patent submissions and supervision of PhD intern students with research on neuro-symbolic models for explainability, transparency and computation-memory-parameter efficiency with ontology-driven graph representation learning • Designed prototypes of GenAI assistants with context-aware LLM reasoning using prompt engineering, fine-tuning, tool-use and RAG applications with LLM frameworks (GPT, Lama, Autogen, LangChain).
Jan 2017 - May 2015	**System and Design Engineer** **Aselsan SST (R&D Defense Industry)**, Turkey • Research and development of target tracking algorithms for day-TV and thermal camera systems.
Apr 2015 - Jul 2013	**Software Engineer** **Aselsan MGEO (R&D Defense Industry)**, Turkey • Software design and development for the communication of the peripheral modules in embedded systems.

Publications

- Izzy Newsham, Eda Bayram, Luca Costabello, "Subgraph Imputation for Open Query Answering in Incomplete Knowledge Graphs", preprint under review, 2023.

- Eda Bayram, "Representation Learning for Multi-relational Data", *Doctoral Thesis*, EPFL, Dec 2021.

- Eda Bayram, "Propagation on Multi-relational Graphs for Node Regression", *International Conference on Complex Networks and Their Applications, 2021.* Springer

- Eda Bayram, Alberto Garcia Duran and Robert West, "Node Attribute Completion on Knowledge Graphs with Multi-Relational Propagation", *ICASSP - IEEE International Conference on Acoustics, Speech and Signal Processing, 2021*

- Eda Bayram, Dorina Thanou, Elif Vural and Pascal Frossard, "Mask Combination of Multi-layer Graphs for Global Structure Inference", *IEEE Transactions on Signal and Information Processing over Networks 6 : 394-406*, 2020

- Eda Bayram, Pascal Frossard, Elif Vural and Aydin Alatan, "Analysis of airborne LiDAR point clouds with spectral graph filtering", *IEEE Geoscience and Remote Sensing Letters 15.8 : 1284-1288.*, 2018

- Eda Bayram, Elif Vural, and Aydin Alatan. "A graph signal filtering-based approach for detection of different edge types on airborne lidar data" *Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing XIII. Vol. 10429. International Society for Optics and Photonics*, 2017.

- Eda Bayram, "Spectral Graph Based Approach for Analysis of 3D LiDAR Point Clouds" *Master Thesis, METU*, Ankara, 2017.

PATENTS

- Eda Bayram, Luca Costabello "Ontology-Driven Parameter-Efficient Representations for Knowledge Graphs", *U.S. Patent Application* 18/161,260 filed in January 30, 2023

- Eda Bayram, Adrianna Janik "Rule-based hypothesis refinement module for link prediction systems", *U.S. Patent Application* 18/356,832 filed in July 21, 2023

- Adrianna Janik, Eda Bayram, Alberto Bernardi "Explanations for Knowledge Graph Embedding Models Based on Game Theory", *Italian Patent Application* 102023000017535 filed in August 23, 2023

ACADEMIC COHORTS

INVITED TALKS

- Participation and presenter in *IEEE SPS/EURASIP Summer School in Network and Data-Driven Learning Fundamentals*, May 2019, Lecce, Itay
- Seminar on *Structure Inference* @ METU, OGAM, Jan 2020, Ankara, Turkey
- Presenter in *2020 IMPRS-IS PhD Symposium* @ The International Max Planck Research School for Intelligent Systems, Tubingen, Germany
- Lightning Talk @ *WiDS Cambridge 2021* virtual conference
- Participation and presenter in *IJCLR 2021 Workshop: Statistical Relational AI (StarAI)*

EVENTS ORGANIZED

- Organization team member of *3rd Graph Signal Processing Workshop – GSP'18* at EPFL, Switzerland
- Volunteer in the organization of *SIGKDD'20*, virtual conference
- Volunteer in the organization and presenter in *WiML 2020* @NeurIPS virtual conference
- Program committee member of *Workshop on Graph Neural Networks and Systems – GNNSys'21* @ MLSys virtual conference
- Organizer and presenter of *Tutorial: Knowledge Graph Embeddings for NLP: From Theory to Practice (KGE4NLP)* @ COLING 2022, Gyeongju, Republic of Korea

SERVICE

- Reviewer for IEEE-TSIPN 2020 *Transactions on Signal and Information Processing over Networks*
- Research Fellowship in *DAAD AINet 2021*, German Academic Exchange Service (DAAD)
- Participation in the mentoring program organized by *Fix the Leaky Pipeline* @ ETH domain
- Reviewer for *Learning on Graphs (LoG) Conference 2022*
- Reviewer for *SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2023*
- Reviewer for *Learning on Graphs (LoG) Conference 2023*