

EDA BAYRAM

Dublin, Ireland

CONTACT INFORMATION

E-mail: eda.bayram@alumni.epfl.ch
Homepage: bayrameda.github.io

PROFESSIONAL SUMMARY

AI Researcher with a PhD in Computer Science and 10+ years of research and engineering experience in both academic and industry settings. Doctoral study on machine learning on multi-relational data and knowledge graph reasoning, with broader interests in graph representation learning, explainable AI, cognitive science, and the philosophy of AI.

Experienced across the full ML pipeline — model implementation, training, and testing — in Python and deep learning frameworks (PyTorch, TensorFlow), with git and issue-tracking systems.

Hands-on with the design and evaluation of LLM-based agentic systems, including fine-tuning, RAG pipelines, and prompt optimisation.

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

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 artificial 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 Vanderghenst](#).

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

LLM Agent Design for Business Analytics (2025 – present)

- Designed, tested, and deployed LLM agents for business analytics: analytical data agents (e.g., NL2SQL) equipped with tool access and grounded in the schema of the business database.
- Developed agentic workflows for the automatic improvement of these agents, including LLM-judge models for failure analysis and evaluation.
- Integrated, benchmarked, and served different LLMs within agents using Ollama and vLLM; agent orchestration and tool use built with LangChain.

Smart Network Innovation (SNI) Lab (2024 – 2025)

- Researched and engineered AI models for digital twin technology in the telecom industry (wireless, optical fiber, and IP networks); developed 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 physical AI; designed interactive prototype web applications with Streamlit for stakeholders to visualize and validate AI-driven simulations.

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, Llama, AutoGen, LangChain).

JAN 2017 -
JUL 2013

SOFTWARE & SYSTEM DESIGN ENGINEER

Aselsan (R&D Defense Industry), Turkey

- Research and development of target tracking algorithms for day-TV and thermal camera systems,
- Software design and development for the communication of peripheral modules in embedded systems.

PUBLICATIONS

PREPRINTS

- Bora Caglayan, Anirudh Madhavan, Eda Bayram, Andrea Tonon and Mingxue Wang, "Can Persona-Conditioned LLM Agents Pre-Screen A/B Tests?", *preprint*, October 2026. [Work conducted at Huawei Ireland Research Center]

JOURNAL ARTICLES

- 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

CONFERENCE PAPERS

- 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, 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.

THESES

- Eda Bayram, "Representation Learning for Multi-relational Data", *Doctoral Thesis*, EPFL, Dec 2021.
- Eda Bayram, "Spectral Graph Based Approach for Analysis of 3D LiDAR Point Clouds" *Master Thesis*, METU, Ankara, 2017.

PATENTS

- Eda Bayram, Bora Caglayan, "Failure-Driven Optimizer for Analytical Data Agents", *patent proposal in preparation*, 2026
- 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, Italy
- 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, Tübingen, Germany
- Lightning Talk @ *WiDS Cambridge 2021* virtual conference

- Participation and presenter in *IJCLR 2021 Workshop: Statistical Relational AI (StarAI)*
- Presenter in *MLDublin Meets @ Accenture*, May 2023, Dublin, Ireland

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
- Volunteer and participant in *Models of Consciousness 2026 (MoC’7) Conference*, October 2026, University of Copenhagen, Denmark

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*