IULIA DUTA

Email: iduta366@gmail.com | **Webpage:** iuliaduta.github.io | **Github:** github.com/IuliaDuta

EDUCATION

University of Cambridge, UK *Oct 2021 - Sep 2025 (Expected)*
PhD in the Department of Computer Science and Technology
Thesis: *Exploring the Power of Hypergraph Processing* | Supervisors: Prof. Pietro Liò and Prof. Ferenc Huszár

University of Bucharest, Romania *Oct 2016 - Jun 2018*
M.Sc. in Artificial Intelligence
GPA 10/10 | Valedictorian distinction
Thesis: *Describing videos in natural language* | Supervisors: Prof. Bogdan Alexe and Prof. Marius Leordeanu

University of Bucharest, Romania *Oct 2013 - Jun 2016*
B.Sc. in Mathematics and Computer Science
GPA 9.97/10 | Valedictorian distinction
Thesis: *Reconstructing topographic map using computational geometry* | Supervisor: Prof. Mihai-Sorin Stupariu

EXPERIENCE

Machine Learning Researcher, Bitdefender *Nov 2016 - Sep 2021*
Member of Machine Learning & Crypto Research Unit, working on fundamental research.
- Led innovative research in video analysis using graph-based neural network techniques.
- Mentored and collaborated with engineering teams to enhance the organisation's AI/ML expertise.
- Published 2 NeurIPS and 1 BMVC papers, contributing to leading advancements in computer vision and AI.

SELECTED RESEARCH AND PUBLICATIONS

- **SPHINX: Structural Prediction using Hypergraph Inference Networks.**
  I. Duta, P. Liò | *ICML 2025*
- **Wasserstein Hypergraph Neural Network.**
  I. Duta, P. Liò | *Under review*
- **Sheaf Hypergraph Networks.**
  I. Duta, G. Cassarà, F. Silvestri, P. Liò | *NeurIPS 2023*
- **Discovering Dynamic Salient Regions for Spatio-Temporal Graph Neural Networks.**
  I. Duta*, A. L. Nicolicioiu* and M. Leordeanu | *NeurIPS 2021*
- **Recurrent Space-time Graph Neural Networks.**
  A. L. Nicolicioiu*, I. Duta* and M. Leordeanu | *NeurIPS 2019*
- **Mining for meaning: from vision to language through multiple networks consensus.**
  I. Duta, A. L. Nicolicioiu*, S. V. Bogolin and M. Leordeanu. | *BMVC 2018*
- **Sheaves Reloaded: A Directional Awakening.**
  S. Fiorini, H. Aktas, I. Duta, S. Coniglio, P. Morerio, A. Del Bue, P. Liò | *Under review*
- **HyperGENIE: A Method for Predicting Enzymatic Gene Essentiality using Hypergraph Neural Networks and Genome-scale Metabolic Models.**
  P. Ioannou, I. Duta , S. Verma, P. Cicuta, P. Liò, C. Angione | *AI4NA ICLR 2025 Workshop*
- **Explaining Hypergraph Neural Networks: From Local Explanations to Global Concepts.**
  S. Su, I. Duta, L. C. Magister, P. Liò | *Arxiv 2025*
- **Joint Diffusion Processes as an Inductive Bias in Sheaf Neural Networks.**
  F. H. Caralt, G. Bernardez, I. Duta, E. Alarcon, P. Liò | *GRaM Workshop ICML 2024*

TEACHING AND MENTORSHIP

Teaching assistant: Served as a teaching assistant for university-level courses on:

- Representation Learning on Graphs and Networks (University of Cambridge)
- Geometric Deep Learning (University of Cambridge)
- Data Structure and Algorithms (University of Bucharest)
- Introduction in Deep Learning (University of Bucharest)

Academic Supervision: Supervised 8 master theses in geometric deep learning and hypergraph neural networks:

- Representing multi-modal data using cellular sheaf (Mar Gonzàlez I Català)
- Geometric deep learning for modelling spatial single-cell transcriptomics (Hrach Yeghiazaryan)
- Directional Sheaf Graph Neural Networks (Hakan Aktas)
- HyperSheaf: a sheaf hypergraph library for multi-modal data (Luke Braithwaite)
- Input attribution and concept explanations for hypergraph neural networks(Shiye Su)
- Sheaf Neural Networks for Heterophilic Data (Ferran Hernandez Caralt)
- Inference higher-order structure in the brain for detecting Alzheimer's Disease (Mathilde Cros)
- Hypergraph Neural Networks for Alzheimer's Disease Classification (George Pulickal)

COMMUNITY & OUTREACH

Conference Organisation: Co-organised the Learning on Graph Conference (LoG) in 2022 and 2023, leading logistics, program design, and speaker coordination.

Conference Reviewer: Reviewer for top ML venues (ICCV, AAAI, CVPR, ECCV, NeurIPS, ICLR, ICML); Best Reviewer Award – GRL Workshop 2020.

Educational Outreach: Designed materials for the first high school machine learning course in Romania in collaboration with AI Romania. The goal of this project is to empower the next generation with essential AI skills and establish a national teacher training program in Romania.

Machine Learning Summer Schools: Contributes to a series of summer schools, including:

- *Eastern European Machine Learning Summer School 2024:* preparing and presenting a practical tutorial on *Graph neural networks and rewiring*.
- *Mediterranean Machine Learning Summer School 2023:* presenting a lecture on *Introduction in Graph Neural Networks*. Video
- *Eastern European Machine Learning Summer School 2022:* preparing and presenting a tutorial on *Dynamics modeling using Graph Neural Netowors*.
- *Eastern European Machine Learning Summer School 2019, 2020:* helping as Teaching Assistant for the practical sessions including Computer Vision, Generative Models and Reinforcement Learning.

HONOURS AND AWARDS

- Awarded the *Twitter PhD Scholarship 2021* to pursue a PhD at Cambridge
- Finalist at the *ACM National* Contest 2014 and 2015.
- Finalist at the *ACM Southeastern European Region* Contest 2014.
- Part of the *extended team of Romania for International Mathematical Olympiad (IMO) 2008.*
- 1 Gold, 5 Silver and 1 Bronze Medals at the *Romanian Olympiad in Mathematics 2007-2013.*

SKILLS

Technical Skills: Pytorch, Pytorch-Geometric, Tensorflow, Python, C/C++
Core Competencies: Expertise in machine learning, graph-based neural networks, and higher-order structures.

Languages: Romanian (native), English (fluent)