

Thodoris Lympelopoulos

Mathematician & Machine Learning Researcher

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 thodoris.lympelopoulos

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Summary

I am a Mathematician with specialty in Applied Mathematics with a degree from the National Kapodistrian University of Athens. I pursued a MSc in Data Science and Machine Learning, offered by the National Technical University of Athens. With a strong background in mathematical theory and problem solving skills, I specialize in Deep Learning and Computer Vision, with a focus on Model Explainability. Currently, I lead research at the research center Demokritos where I develop novel approaches in Explainable AI. My work lies at the intersection of Attribution methods, Mechanistic Interpretability and Causality, offering novel ideas for shaping the field.

Research Interests

Explainable AI. Attribution methods and concept-based analysis. Mechanistic Interpretability and Causality. Training dynamics and phenomena. Supervised learning and classification. Learning and loss geometry. Object detection and image classification. Depth estimation. Deep architectures and conceptual understanding. Model pruning and quantization.

Employment History

- Dec 2024 – Current  **Machine Learning Researcher**, National Center for Scientific Research "Demokritos".
- Apr 2023 – Aug 2024  **Machine Learning Engineer**, Seaquest Marine Technologies.
- Dec 2020 – Aug 2021  **Software and Data Engineer**, Athens Technology Center.

Education

- 2021 – 2023  **M.Sc. in Data Science and Machine Learning**, National Technical University of Athens.
Grade: Excellent (9.39/10).
Thesis title: *A Study of Explainable AI. The Concept of Zero Information.*
- 2016 – 2020  **B.Sc. in Mathematics**, National Kapodistrian University of Athens.
Grade: Excellent (8.82/10).

Education (continued)

2013 – 2015  **High School Diploma, European Baccalaureate**, European School of Brussels III.
Grade: 82.33/100.

Skills

Languages	 Greek (native), English (C1), French (C1), Italian (A1), Spanish (A1).
Coding	 Python (expert), Java, Matlab & R (proficient).
Python Libraries	 Pytorch, Tensorflow, d2l, mxnet, Captum.
Web Dev	 HTML, CSS, JavaScript, React, next.js.
Interests	 Mathematics & Philosophy. Physics & Biology. History and social sciences.

Achievements

2023  **Best MSc Thesis**, for the MSc program "Data Science and Machine Learning" in NTUA.

Research Publications

- 1 T. Lympelopoulos, I. Kakogeorgiou, and D. Kanellopoulou, *Xtrain: Training-guided occlusion for feature attribution*, 2026. arXiv: 2606.10877 [cs.LG].  URL: <https://arxiv.org/abs/2606.10877>.
- 2 T. Lympelopoulos and D. Kanellopoulou, *From weight perturbation to feature attribution for explaining fully connected neural networks*, 2026. arXiv: 2605.15328 [cs.LG].  URL: <https://arxiv.org/abs/2605.15328>.