

Dimitrios Papaioannou

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Professional & Research Objective

AI Engineer specializing in Computer Vision and multimodal learning, with experience in building end-to-end ML pipelines and scalable AI systems. Strong background combining research (publications, EU projects) with real-world industry applications, focusing on production-oriented AI solutions in agriculture and robotics.

Work and Research Experience

AI Engineer (Computer Vision), IKnowHow SA. – Athens, GR Nov 2025 – Present

- Designed a semi-automated annotation pipeline using YOLO11 for bbox generation and SAM2 for mask refinement via text and bbox-guided prompts, managed dataset versioning on Roboflow
- Developed and benchmarked RF-DETR and YOLO family models for leaf detection ($mAP@50$: 92%) and tomato ripeness classification on edge devices, authored technical report on accuracy/compute trade-offs
- Implemented a vegetation index-based plant health alert system (NDVI, NDWI, NIR-derived indices) from multispectral imagery to flag disease indicators and estimate water content
- Conducted greenhouse field campaigns using multispectral imaging (RGB + NIR bands) to create a novel dataset for plant disease detection and downstream classification tasks
- Engineered a modular multimodal classification pipeline for RGB and multispectral imagery, improving classification accuracy from 83% to up to 90%, enabling flexible experimentation with stacked-band inputs and attention-based multi-branch fusion architectures
- Maintained collaborative ML workflows using Git/GitHub, managed model and dataset versioning via Hugging Face, and performed hyperparameter optimization with Optuna and experiment tracking using MLflow

AI Researcher (Computer Vision), AIIA Lab | Aristotle University of Thessaloniki – Sept 2023 – Nov 2025
Thessaloniki, GR

- Researched adversarial robustness (One-vs-One classification) and real-time semantic segmentation, submitted 1 journal paper (Neurocomputing, under review) and published 3 conference papers (IEEE ISCC 2025, IEEE CCGrid 2025, IEEE ICIPCW 2024)
- Developed a ROS-based real-time flood water segmentation system for disaster prediction and built an Android GPS tracking app for emergency response
- Contributed to EU Horizon TEMA Project deliverables. Presented research at IEEE CCGrid (Tromsø, Norway) and IEEE ISCC (Bologna, Italy) as oral presenter

AI Researcher (Blockchain and Deep Learning), AIIA Lab | Aristotle University of Jan 2022 – Jan 2023
Thessaloniki – Thessaloniki, GR

- Researched Deep Learning applications in Blockchain systems. Authored MSc thesis on distributed consensus inference and submitted journal paper on decentralized DNN inference
- Delivered guest lecture on Blockchain Consensus Protocols and Cryptocurrencies at Aristotle University (Feb 2022), invited by Prof. Ioannis Pitas
- Developed educational materials on Cryptography and Blockchain for the EU Horizon AI4Media Project.

Education

Aristotle University of Thessaloniki, BSc in Mathematics Sept 2013 – Sept 2019

Aristotle University of Thessaloniki, MSc in Digital Media - Computational Sept 2020 – Sept 2022
Intelligence

Selected Publications

- [8] Dimitrios Papaioannou, Vasileios Mygdalis, and Ioannis Pitas. “Towards human society-inspired decentralized DNN inference”. In: *Signal Processing: Image Communication* (2025), p. 117306. ISSN: 0923-5965. DOI: <https://doi.org/10.1016/j.image.2025.117306>. URL: <https://www.sciencedirect.com/science/article/pii/S0923596525000530>.
- [6] Dimitrios Papaioannou, Vasileios Mygdalis, and Ioannis Pitas. “Proof of Quality Inference (PoQI): An AI Consensus Protocol for Decentralized DNN Inference Frameworks”. In: *2024 IEEE Symposium on Computers and Communications (ISCC)*. IEEE. 2024, pp. 1–7.
- [4] Dimitrios Papaioannou, Vasileios Mygdalis, and Ioannis Pitas. “A Distributed Sharding BFT Consensus Approach, for Efficient Decentralized DNN Inference”. In: *proceedings of 2025 IEEE Symposium on Computers and Communications (ISCC)*. IEEE. 2025.
- [3] Anastasios Gerontopoulos et al. “Real-Time Flood Water Segmentation with Deep Neural Networks”. In: *proceedings of 2025 IEEE 24th International Symposium on Cluster, Cloud and Internet Computing (CCGrid)*. 2025.

Academic Activities

- **Guest Lecture: Blockchain Consensus Protocols and Cryptocurrencies**, Aristotle University of Thessaloniki 02/2022
- **Reviewer - IEEE International Conference on Image Processing (ICIP)**, 2025 - 2026
- **Support Team Member/Session Moderator at AIDA - AICET 2025**, 2025

Technologies

Languages: Python, C#, Solidity, Mathematica, Kotlin (low), JavaScript (Low), Matlab

Tools/Frameworks: Unity, PyTorch, TensorFlow, ROS, Docker, Roboflow, HuggingFace, Optuna, MLFlow

IDEs/Other: Pycharm, VS Code, Overleaf, PowerPoint

E-Learning and Certificates

- IBM Generative AI Engineering • Microsoft AI & ML Engineering • AWS Generative AI for Developers