Andreas Varvarigos

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Google Scholar | GitHub | LinkedIn

Research Interests

I am interested in Large Language Models (LLMs) and multimodal foundation models, including time-series models, and in extending and aligning them through post-training reinforcement learning and geometric and graph-structured representations, with applications in network observability and finance.

Education

Yale University, Ph.D. in Electrical and Computer Engineering — Aug 2024 – Present

- **Advisor:** Leandros Tassiulas

Yale University, M.Sc. in Electrical and Computer Engineering — Aug 2024 – May 2026

- GPA: **4.0 / 4.0**
- **Courses:** Deep Learning for Graph-Structured Data, Intermediate Machine Learning, Building Distributed Systems, Network Algorithms and Stochastic Optimization, Deep Learning Theory and Applications, Trustworthy Deep Learning etc.

Imperial College London, M.Eng. in Electronic and Information Engineering — Sept 2020 – June 2024

- **Grade:** First Class Honors, Dean's List Prize Years 1-3
- **Courses:** Machine Learning, Deep Learning, Optimization, Computer Vision and Pattern Recognition, Signal Processing and Machine Learning for Finance, Mathematics for Machine Learning, Communications Networks, etc.

Work Experience

Video Computer Vision Intern, Apple Inc. — June 2026 – Aug 2026

- Designing and implementing efficient training and evaluation pipelines for deep learning models in video computer vision.

Logic Design Engineer, NVIDIA — Aug 2023 – Oct 2023

- Implemented scheduling algorithms in a NIC that can deliver total packet order at 100 Gbps, outperforming, throughput-wise, SOTA designs with Lamport clocks
- Used DPDK, a set of libraries/drivers for fast packet processing that allows networking applications to run much faster

Software Developer, OpenLightComm Ltd. — Dec 2022 – Sep 2023

- Designed and implemented in Python an access planning tool for optimally deploying the optical front/mid/backhaul of 5G networks, to serve residential and 5G mobile users, different base station types (macro and small cells), wireless environments, and functional split choices

Research Intern, Harokopio University of Athens — June 2022 – Aug 2022

- Implemented SOTA intent-based allocation algorithm for cloud computing resources using Q-Learning
- Implemented and evaluated three major edge computing storage systems for IoT, namely MinIO, IPFS, and BigchainDB, by considering transaction rate, number of user requests, response time, and resource utilization

Research Intern, National Technical University of Athens — June 2021 – Aug 2021

- Implemented image segmentation model based on attention recurrent residual U-Net for visual road crack inspection

Selected Publications

- TelePrism: A Multi-Modal Foundation Model for Telecom Time Series Reasoning; **A. Varvarigos**, A. Maatouk, S. Gu, R. Kansoh, Y. Gao, L. Tassiulas, R. Ying, submitted to MobiHoc 2026
- LitBench: A Graph-Centric Large Language Model Benchmarking Tool For Literature Tasks; **A. Varvarigos**, A. Maatouk, J. Zhang, N. Bui, J. Chen, L. Tassiulas, R. Ying, *Proceedings of the 32nd ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2026, Jeju, South Korea
- TelecomTS: Observability Dataset for Multi-Modal Time-Series and Language Analysis; A. Feng*, **A. Varvarigos***, I. Panitsas, D. Fernandez, Y. Guo, J. Wei, J. Chen, A. Maatouk, L. Tassiulas, R. Ying, *Proceedings of the 43rd International Conference on Machine Learning*, 2026, Seoul, South Korea
- Intent-based Allocation of Cloud Computing Resources Using Q-Learning; P. Kokkinos, **A. Varvarigos**, D. Konidaris, K. Tserpes, *International Symposium on Algorithmic Aspects of Cloud Computing*, Netherlands, 184–196, Sept. 2023

Teaching Experience

Graduate Teaching Assistant, Yale University, New Haven, CT, USA

- ECE 4551 / 9631 Network Algorithms and Stochastic Optimization — Jan 2026 – May 2026
- ECE 2020 Introduction to Communications and Control — Aug 2025 – Dec 2025

Honors/Awards

- Bodossaki Foundation Scholarship for Graduate Studies, 2024-2029
- Columbia Global Centers Lab-to-Market; selected as one of 25 teams, 2025-2026
- Dean's List Years 1, 2, 3 awarded by Electrical & Electronic Engineering Dept of Imperial to the students that are within the top 10% and have achieved the equivalent of a 1st for the year, 2020-2023
- Member of National Math Team of Greece for International Math Olympiad and Balkan Math Olympiad, 2020
- Gold (11th grade, 2019; 12th grade, 2020) and Bronze (9th grade, 2017) medals in the Euclid Math Competition; Silver (2020) and Bronze (2019) medals in the Archimedes Math Olympiad (10th–12th grade)

Selected Projects

Hybrid Graph-Language Model for Chemical Property Prediction, 2025 — GitHub

- Developed a hybrid model combining Graph Neural Networks (GNNs) and Large Language Models (LLMs) for molecular property prediction by injecting GNN-derived graph embeddings and textual context into the LLM
- Enabled accurate natural language generation of chemical descriptors (e.g., molecular weight, polarity, atom counts) across diverse molecules

GNN-Policy RL for Delay-Aware Packet Routing, 2025 — GitHub

- Designed an RL agent for adaptive packet routing using a GNN to make per-node forwarding decisions
- Simulations on small-world topologies under varied traffic loads demonstrated our framework's effectiveness

Temporal GNNs for Stock Return Prediction, 2024 — GitHub

- Built a framework for stock return prediction on S&P 500 data using temporal Graph Neural Networks (GNNs)
- Constructed multiple stock dependency graphs and tested GCN and GAT architectures on each
- Integrated LSTM modules with GNNs to capture both temporal and relational features
- Benchmarked standard GNNs, LSTMs, and temporal GNNs, showing the latter outperformed the others

Semantic Video Reconstruction with Diffusion Models (Thesis), 2023 - 2024 — Report | GitHub

- Proposed a high-compression video transmission framework, sending segmentation maps instead of full frames
- Designed a diffusion model that reconstructs each frame using its segmentation map and a sequence of previously reconstructed frames (to-be-deployed in receiver side)
- Used Stable Diffusion to condition on prior frames and ControlNet on the current frame's segmentation map
- Enabled efficient reconstruction in bandwidth-constrained scenarios such as drone video streaming

Music synthesizer, 2023 — GitHub

- Implemented, in a team of 4, embedded software for a music synthesizer using an STM32
- Features included different octaves, volume levels, waveforms, simultaneous key presses, a joystick used as pitch bender and volume modifier, record and playback operations, and user-friendly, multi-page display

Autonomous Pet Caretaker (iFeed), 2023 — Marketing | GitHub

- Designed and 3D-printed an automated pet feeder with web-based scheduling, multi-pet profiles, and audio alerting pets; integrated computer vision to verify the correct pet before dispensing; included built-in live stream
- Built on Raspberry Pi Zero with MQTT communication to a custom webserver; full-stack system developed in Vue (front-end) and Python (back-end)

Skills

Programming: Python (incl. PyTorch, TensorFlow, Keras, SciKit-learn), C++/C, MATLAB, Go, SQL, Verilog, Bash Scripting

Technologies: verl, DeepSpeed, vLLM, Docker, Kubernetes, Linux, FPGA, Arduino

Languages

- English (fluent), Greek (native), German (good), French (basic)
- F-1 Student Visa, Greek Citizenship, UK Settled Status