Angelos Ioannis Lagos

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EDUCATION

Athens University of Economics and Business (AUEB), Athens, Greece   09/2021 - Ongoing
- BSc in Management Sciences and Technology (240 ECTS)
  - Grade: 8.9/10 *(top 5%)*
  - Major: Operations Research

Nationwide University Entrance Examination score: 19.143 / 20.000 (top 1% nationwide)   06/2021

PROFESSIONAL, RESEARCH, AND VOLUNTEERING EXPERIENCE

Mechanistic Interpretability Research Fellow

Supervised Program for Alignment Research (SPAR), remote   09/2025 - ongoing

- Conducting research on multi-step reasoning representations in large language models, under the mentorship of **Shivam Raval (Harvard SEAS).**
- Designed structure-aware probing methods, including
  - a hyperbolic embedding probe to analyze hierarchical depth in reasoning chains, and
  - a graph-distance probe to study step dependencies and error propagation.

Hybrid Quantum–Classical Optimization Researcher

Quantum Neural Technologies (QNT), Athens, Greece   06/2024 - ongoing

- Designed hybrid quantum–classical optimization pipelines, including a hybrid model using Quantum Approximate Optimization Algorithms to solve a small-scale VRP variant.
- Developed and benchmarked quantum-based true randomness protocols as part of a team of three postdoctoral physicists and mathematicians, integrating qubit-level randomness extraction for secure and scalable deployment. I benchmarked the outputs using NIST SP800-22 tests to validate entropy quality.
- Built multi-agent LLM systems using LangGraph for internal research prototypes, including an agent-based debate and reasoning framework leveraging retrieval and web search.
- Developing isomorphism-invariant graph compression methods that preserve distinguishability under the 1-Weisfeiler–Leman test.

Researcher in Mathematical Optimization Methods

ELTRUN Research Center, Athens University of Economics and Business, Athens, Greece   12/2023 - ongoing

Supervisors: Prof. Ioannis Mourtos and Dr. Georgios Zois; collaborating with a postdoctoral and two PhD researchers.

- Conducting research in mathematical optimization for the EU-funded project Tec4MaaSEs, focusing on scheduling and platform-scale assignment problems. I co-developed, a Mixed-Integer Linear Programming model, a Constraint Programming formulation, and multiple heuristics and metaheuristics for a multi-objective flow-shop scheduling problem. Results were **published in APMS 2025**.
- Extended this work to large-scale flexible job shop settings, developing a Teacher–Learner-based heuristic and fairness-aware assignment mechanisms for an upcoming **IJPR submission**.
- Co-developing an RL-CP hybrid for large-scale Hybrid Flexible Flow Shop Scheduling, where RL generates batches and factory assignments, CP computes exact per-batch rewards, and a separate heuristic provides global earliness-tardiness reward signals; the RL policy outperforms heuristic baselines. Under review at **CPAIOR 2026**.
- Co-designed, a divide-and-conquer framework for the Vehicle Routing Problem with Time Windows (VRPTW), incorporating clustering-based decomposition, adaptive perturbation operators, and large-instance repair strategies.
- Co-developed an online Reinforcement Learning pipeline for dynamic scheduling, integrating Reptile warm-starts, PPO-based policy optimization, and constraint-aware masking for real-time rolling-horizon decision making in Flexible Job Shop environments.

Applied Cryptography Researcher, Greek University Network, Athens, Greece   11/2023 - 09/2025

- Created a multi-device benchmarking suite for verifiable-credential schemes, quantifying performance trade-offs between cryptographically linkable and unlinkable designs. Accepted as a **first-author paper** for **ACM SAC 2026**.
- Worked in a team of 20+ developers and cryptographers from across Europe on the **DC4EU** initiative, focusing on interoperability and secure credential handling. Led the credential-issuance implementation in collaboration with contributors such as Emil Lundberg (Yubico), implementing OpenID and OAuth 2.0 protocols.
- **Co-authored a paper** on a cloud-based, non-custodial digital identity wallet, **published at EUNIS 2025.**

Machine Learning Developer & Data Analyst, MSENSIS, Athens, Greece   09/2023 - 04/2024

- Developed a machine learning pipeline to predict weather patterns using geological and environmental sensor data, supporting infrastructure planning decisions.
- Performed data preprocessing, feature engineering, and exploratory analysis to identify optimal sensor placement locations and generate actionable insights.

PUBLICATIONS

- **Angelos Ioannis Lagos**, Diomidis Spinellis, Nikolaos Alexopoulos "Measuring the Performance of Candidate Verifiable Credential Schemes for the EU Digital Identity Wallet." (ACM Symposium on Applied Computing, 2026)
- **Angelos Ioannis Lagos**, Ioannis Avgerinos, Georgios Zois, Ioannis Mourtos, Patricia Casla "Optimising a Manufacturing-as-a-Service Platform Through Mathematical Modeling" (*APMS*, 2025)
- Panagiota Stamatopoulou, Charalampos-Michail Katimertzis, Grigorios Katrakazas, Emmanouil Koukoularis, **Angelos Ioannis Lagos**, Nikos Voutsinas, "wwWallet.org: a Cloud Based Non-custodial Digital Identity Wallet." (*EUNIS*, 2025)
- Ioannis Avgerinos, Christos Katrinakis, Andreas Ktenidis, **Angelos Ioannis Lagos**, Georgios Zois, Ioannis Mourtos "Enhancing Scalability in Distributed Flexible Flowshop Scheduling: A Hybrid RL-CP approach" (under review at CPAIOR 2026)
- **Angelos Ioannis Lagos**, Aryan Sharma, Cutter Dawes, Shivam Raval "Hierarchical Structure in LLM Representations" (to be submitted to ICML2026)
- **Angelos Ioannis Lagos**, Ioannis Avgerinos, Georgios Zois, Ioannis Mourtos "Large-Instance Flexible Job Shop Scheduling in MaaS: Metaheuristic Evaluation, TLBO Variant Effectiveness, and Price-of-Fairness Insights" (to be submitted to IJPR 2026)

HONORS & AWARDS

- AI-integrated app **award** by the **university** as one of **the top projects of the year** (2024).
- 2nd place in the **national economic competition** Economia (2023).
- Finalist in the national JA Start Up Competition (2023).
- 1st **place** in the "IDEA" startup and entrepreneurship competition (2023).
- 1st **place** in the AUEB "Business Game" market simulation competition (2021).
- Award from the **Hellenic Mathematical Society** for distinction in the "Little Euclid" competition.

SKILLS

- Programming   Java, Python, JavaScript, TypeScript
- Machine Learning   PyTorch, XGBoost, scikit learn,
- (Quantum) Optimization   CPLEX, PyVRP, Qiskit

SOCIETIES & AFFILIATIONS

- What Politics Means, Chief Editor 2022-2025.
- AUEB Finance Club, Financial Engineering Analyst, 2022-2024.

LANGUAGES

- **English** (fluent), **Greek** (native).