

# Angelos Ioannis Lagos

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## EDUCATION

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### 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

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### 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 **CRAIOR 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.

- 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**.

- 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

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- 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, Grigoris Katrakazas, Emmanouil Koukoularis, **Angelos Ioannis Lagos**, Nikos Voutsinas, “[wwwWallet.org: a Cloud Based Non-custodial Digital Identity Wallet](#).” (EUNIS, 2025)
- Ioannis Avgerinos, Andreas Ktenidis, **Angelos Ioannis Lagos**, Christos Katrinakis, 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

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

## SKILLS

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

## SOCIETIES & AFFILIATIONS

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

## LANGUAGES

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- English (fluent), Greek (native).