Eleni Psaroudaki

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Key Achievements

- **ICML 2022 Long Presentation (Top 10%).** Provided fundamental computational learning research on the Label Ranking problem through nonparametric regression.
- **Horizon Europe Project Contributor.** Contributed to key research on fairness and explainability (AutoFair).
- **Proactive ML in Space Industry.** Created a labeled dataset for anomaly detection in ESOC ground systems'.

Education

PhD Candidate in Computer Science *Oct. 2018 - Dec. 2025 (expected)*
NTUA (National Technical University of Athens) *Athens, Greece*

- **Topic.** "Efficient learning and optimization of rankings"
- **Advisor.** Prof. Dimitris Fotakis
- **Research Interests.** Machine Learning · Fairness and Explainability · Computational Social Choice

Diploma (MEng) in Electrical & Computer Engineering *Oct. 2012 - Oct. 2017*
NTUA (National Technical University of Athens) *Athens, Greece*

- **Thesis.** "Comparative Evaluation of Multiwinner Voting Rules"
- **Advisor.** Prof. Dimitris Fotakis
- **Grade.** 8.32/10

ML Skills Highlight

- **Programming Languages.** Python · Java · C/C++ · SQL · Matlab · Angular · R
- **Frameworks and Tools.** Scikit-Learn · NumPy · Pandas · SciPy · PySpark · Matplotlib · Keras · Tensorflow
- **Specializations.** Ethics and Fairness in AI · Explainable AI (XAI) · Time Series · Learning Problems

Research Experience

Archimedes Research Unit, Athena Research Center *Athens, Greece*
Graduate Research Intern *Mar. 2024 - Aug. 2024*

- **Fair Preference Aggregation.** Researched the compatibility of proportionality and individual fairness guarantees in optimization-based approval voting rules.

Information Management Systems Institute, Athena Research Center *Athens, Greece*
Research Associate *Jan. 2023 - Feb. 2024*

- **Fairness Auditing.** Used counterfactual explanations to detect subgroup bias in AI models, generalizing 'fairness of recourse' and contributing to[3] and the development of the FACTS framework, later integrated in the AI Fairness 360 toolkit [code].
- **Global Counterfactuals.** Designed clustering-based counterfactual methods for global explainability, contributing to [5].
- **Preference Aggregation & Fairness.** Applied online learning techniques that guarantee stable approximations in rank aggregation, researching trade-offs between social welfare and fairness.

National Technical University of Athens *Athens. Greece*
PhD Candidate *Feb. 2021 - Dec. 2023*

- **Timeseries Clustering.** Designed and evaluated experimentally timeseries clustering techniques using Sparse Gaussian Process Regression and k-means leading to [4*] [code].
- **Label Ranking.** Provided theoretical performance guarantees for efficient algorithms using decision trees and random forest for complete LR, under a nonparametric regression approach, leading to [1*] [code].

Industry Experience

Software Competitiveness International *Athens, Greece*

Machine Learning Engineer, Space Industry Team *Jun. 2019 - Dec. 2020*

- Developed supervised and unsupervised ML models for anomaly detection in space ground systems (ESOC). The results were presented in ESAW 2021 and lead to [2].
- Analyzed and visualized ESOC ground systems logs, using mainly Elastic Stack and Python, and created a standardized labeled benchmark for anomaly prediction.

Software Engineer, Digitalization & Space Industry Team *Oct. 2017 - Jun. 2019*

- Developed backend solutions for a used vehicle e-commerce platform, utilizing Java and SpringBoot framework, PostgreSQL, and ElasticSearch for complex search queries.
- Developed an Eclipse RCP decision-making application with Java-FX 8 and JBoss Drools.

Selected Publications

[1*] D. Fotakis, A. Kalavasis, and E. **Psaroudaki**, "Label ranking through nonparametric regression," in *International Conference on Machine Learning*, PMLR, 2022, pp. 6622–6659.

[2] H. Petreski, P. Veskos, R. Santos, E. **Psaroudaki**, and R. Prasad, "Log analysis for anomaly prediction in ground segment space systems," in *2022 25th International Symposium on Wireless Personal Multimedia Communications (WPMC)*, 2022, pp. 447–452. DOI: 10.1109/WPMC55625.2022.10014733.

[3] L. Kavouras, K. Tsopelas, G. Giannopoulos, D. Sacharidis, E. **Psaroudaki**, N. Theologitis, D. Rontogiannis, D. Fotakis, and I. Emiris, "Fairness aware counterfactuals for subgroups," *Advances in Neural Information Processing Systems*, vol. 36, 2024.

[4*] D. Fotakis, P. Patsilinakos, E. **Psaroudaki**, and M. Xefteris, "Efficient time-series clustering through sparse gaussian modeling," *Algorithms*, vol. 17, no. 2, 2024, ISSN: 1999-4893. DOI: 10.3390/a17020061.

[5] L. Kavouras, E. **Psaroudaki**, K. Tsopelas, N. Theologitis, D. Rontogiannis, D. Sacharidis, G. Giannopoulos, D. Tomaras, K. Markou, D. Gunopulos, D. Fotakis, and I. Emiris, "Glance: Global actions in a nutshell for counterfactual explainability," *Under Submission*, 2024.

*Names are listed in Alphabetical Order

Selected Workshops & Schools Attendance

Workshop on Algorithms Learning & Economics (WALE 2024) *Kefalonia, Greece*

Archimedes (co-organized) *17-21 June 2024*

4th ACM Europe Summer School on Data Science *Athens, Greece*

Association for Computing Machinery *10-14 July 2023*

2022 Princeton Machine Learning Theory Summer School *Princeton, New Jersey, USA*

Princeton University *13-17 June 2022*

2022 Hausdorff School "Algorithmic Data Analysis" *Bonn, Germany*

Hausdorff School *23-27 May 2022*

Teaching Experience

School of Electrical and Computer Engineering, NTUA *Athens, Greece*

Graduate Teaching Assistant @ Undergrad Courses *Oct 2018 - Present*

- Algorithms and Complexity (7^{th} sem.) · Discrete Mathematics (4^{th} sem.) · Introduction to Programming (1^{st} sem.)

Laboratory Assistant @ Undergrad Courses *Oct 2013 - Oct 2017*

- Introduction to Programming (1^{st} sem.) · Programming Techniques (2^{nd} sem.)

Languages

- Greek (Mother Tongue) · English · German · Spanish