Nikolaos Roufas

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Education

BSc Computer Science, Ionian University, Corfu, Greece 09/2024 – Present

- Coursework: Algorithms, Data Structures, Operating Systems, Deep Learning, NLP, Databases.
- Expected graduation: 2028; ranked top 3%.

Erasmus+ Exchange, Sapienza Università di Roma, Italy 10/2025 – 02/2026

- Focus: Artificial Intelligence, Machine Learning, and Data Science.
- Coursework: Advanced ML, Computational Intelligence, Neural Networks, and Scientific Programming.
- Strengthening applied ML, reproducibility, and cross-disciplinary collaboration in academic environments.

Research Experience

Undergraduate Researcher, Ionian University – Corfu, Greece 09/2024 – Present

- Conducting research on **transformer architectures and Machine Learning systems** for cross-domain tasks in climate science, legal AI, and bioinformatics, improving model efficiency by ∼30%.
- Developed and maintained **reproducible ML pipelines** integrating Qiskit and PyTorch, deployed on HPC clusters and open-sourced with 200+ downloads.
- Co-authored peer-reviewed publications (Frontiers, Springer) on transformer optimization, interpretability, and scientific computing.

Visiting Research Student, Sapienza Università di Roma – Rome, Italy 10/2025 – 02/2026

- Developing **Self-Explainable Neural Networks (SENN)** for interpretable AI in social data.
- Evaluating transparency metrics and feature attribution methods for large-scale neural models.
- Implementing SENN architectures in PyTorch and benchmarking on institutional HPC environments.

Publications

- Karamitsos, I., **Roufas, N.**, Al-Hussaeni, K., & Kanavos, A. LegNER: A Domain-Adapted Transformer for Legal Named Entity Recognition and Text Anonymization. *Frontiers in Artificial Intelligence, 8, 1638971.*
- **Roufas, N.**, Mohasseb, A., Karamitsos, I., & Kanavos, A. (2025, June). Analyzing Public Discourse and Sentiment in Climate Change Discussions Using Transformer-Based Models. In *IFIP International Conference on Artificial Intelligence Applications and Innovations* (pp. 39–53). Cham: Springer Nature Switzerland.
- **Roufas, N.**, Karamitsos, I., Al-Hussaeni, K., Gerogiannis, V. C., & Kanavos, A. (2025). *Efficient Protein Folding with Transformer Models Using the Performer Architecture.* International Conference On Advances In Information And Communication Technology 2025 – (In Press)
- **Roufas, N.**, Kanavos, A., Karamitsos, I., Al-Hussaeni, K., & Maragoudakis, M. (2025, December). Do deeper layers explain better? An LID-based study of transformer explainability. In *Proceedings of the 10th Workshop on Advances in High Dimensional (AdHD) Big Data. IEEE.* – (In Press)

Honours & Awards

- **Academic Excellence Award (2024)**
  First High School of Florina
- **Creativity Award (2017)**
  WRO Hellas Robotics Competition
- **4th Place in Hellenic Fencing Championships (2024)**
  Hellenic Fencing Federation

Technical Skills

Programming Languages:
Python (NumPy, pandas, PyTorch, TensorFlow, scikit-learn), C++, Bash, SQL, Git, Linux, JavaScript, HTML/CSS

ML & AI Frameworks:
PyTorch, TensorFlow, scikit-learn, Keras, NLTK, Hugging Face Transformers, OpenCV, Qiskit

DevOps & Tools:
Docker, Kubernetes, GitLab CI/CD, Linux HPC Systems, Jupyter, VS Code, Anaconda, Conda Environments

Databases & Backend:
MySQL, PostgreSQL, Flask, RESTful APIs, PHPMyAdmin

Mathematics & Scientific Computing:
Linear Algebra, Probability, Statistics, Optimization, Numerical Methods, Scientific Python

Visualization:
Matplotlib, Seaborn, Plotly, Tableau, Power BI

Languages

Greek: Native

English: C2 (Proficient)

French: B2

German: B1

Portuguese: A2

Transferable Skills

Communication & Collaboration:
Scientific communication, academic writing, cross-disciplinary teamwork, active listening

Analytical & Cognitive Skills:
Analytical problem-solving, critical thinking, attention to detail, structured reasoning

Personal Effectiveness:
Adaptability, curiosity-driven exploration, organization, time management, self-motivation