Curriculum Vitae

Francesco De Luca

General Information

Date and place of birth: 18 Marzo 2000, Paola (CS), Italy
Nazionality: Italian
Current position: PhD student in ICT at DIMES, University of Calabria, Rende (CS), Italy
Work Address: via Pietro Bucci 41C, 87036 Rende (CS), Italy
Email: francesco.deluca@dimes.unical.it

1 Biographical notes, education, and positions held

– Francesco De Luca was born in Paola, Italy, on March 18, 2000.

– On Dec. 6, 2021, he received a Bachelor's degree in computer engineering with Honors from the University of Calabria, discussing a thesis entitled "Microservice Architectures and Service Mesh".

– On Dec. 16, 2022, he was awarded as *Student of Excellence* with the "Percorso di eccellenza" grant in recognition of his outstanding academic record in terms of number of exams and average grade achieved at the DIMES Department of the University of Calabria.

– On Oct. 16, 2023, he received a Master's degree in Computer Engineering, specialization in Artificial Intelligence, and Machine Learning, with Honors from the University of Calabria, discussing the thesis entitled "Study and experimentation of Negative Learning approaches for Anomaly Detection".

– He is a Ph.D. student in *Information and Communication Technology* at the Department of Computer, Electronic and Systems Engineering at the University of Calabria from November 1, 2023, as a winner of the competition *D.M. 118/2023 - Pubblica Amministrazione - Digitalizzazione della Pubblica Amministrazione*. Prof. Fabrizio Angiulli and Prof. Fabio Fassetti supervise research activities.

2 Education

– Master's Degree in Computer Engineering (Artificial Intelligence and Machine Learning), University of Calabria, Rende (CS), Italy.

  Thesis title: *Study and testing of negative learning approaches for Anomaly Detection.*

  Supervisor: Prof. Fabrizio Angiulli, Co-supervisor: Dr. Luca Ferragina.

  Graduation grade: 110/110 Cum Laude.

  Date of Achievement: 16/10/2023.

– Bachelor's Degree in Computer Engineering, University of Calabria, Rende (CS), Italy.

  Thesis title: *Microservice Architectures and Service Mesh.*

  Supervisor: Prof. Sergio Flesca.

Graduation grade: 110/110 Cum Laude.

Date of Achievement: 06/12/2021.

3 Honors and Awards

- **Best Project proposal award** - Doctoral School "Artificial Intelligence for a Secure Society", for the project proposal *Harnessing LLM Agents and RAG for Trustworthy Fake News Detection*, 9-10 September 2024, Ricadi (VV), Italy

- **Student of Excellence** - "Percorso di eccellenza" grant, for academic merits at the DIMES Department of the University of Calabria, Rende (CS), Italy.

4 Education activities

In his academic career, Francesco De Luca has acquired engineering and computer science skills. In his Master's degree course, he specialized in Artificial Intelligence and Machine Learning, with particular interest in sub-symbolic techniques. During the same course, he has developed many teaching projects in different areas of Artificial Intelligence, including *Computer Vision* (Diffusion Models for Conditional Face Generation), *Social Network and Media Analysis* (A Multimodal Approach for MEME Classification) and *Deep Learning* in general (Multi-task Learning), and acquired skills including data analysis and the use of frameworks such as TensorFlow and PyTorch. During his Ph.D., he participated in numerous teaching activities, including doctoral courses, seminars, and workshops; he also participated in a doctoral school and was the winner of the related competition: *Best Project proposal - Artificial Intelligence for a Secure Society*.

5 Research activities

The main research area of Francesco De Luca concerns machine learning systems and in particular methodologies related to neural networks. In his Master's thesis in Computer Engineering, he worked on unsupervised techniques for Anomaly Detection. During his Ph.D., he has focused on the use of *Large Language Models* for *Explainable Artificial Intelligence* and for *Anomaly Detection*. The following is a summary description of the directions followed for each line of research.

- *Explainable Artificial Intelligence*: he has investigated techniques of Explainable Artificial Intelligence, delving into the *post-hoc* approach and methods based on *Interpretable Local Surrogates*. During his research, he proposed a methodology [1] in which he introduced a technique for generating neighborhoods for training local surrogates and a technique for creating more interpretable explanations and counterfactuals.

- *Anomaly Detection in Time Series*: investigated the use of *Large Language Models* for anomaly detection in time series, delving into LLMs' numerical sequence processing and generalization capabilities. The research was conducted using a Zero-Shot and unsupervised approach [2].

6 List of Publications

In all publications listed, all authors contributed equally to all stages of writing.

Conferences

[1] F. Angiulli, F. De Luca, F. Fassetti e S. Nisticò, "Large Language Models-based Local Explanation of Text Classifier," in *Discovery Science - 27rd International Conference, DS 2024, Pisa, Italy, October 14-16, 2024, Proceedings*.

Manuscript

[2] F. Angiulli, F. De Luca e F. Fassetti, "TiLLMeOut: Time Series Large Language Models-based Outlier Detection," 2025.

7   Participation as a Speaker at Conferences of International Interest

Francesco De Luca has been a speaker at the following international conferences and for presenting the indicated papers:

- *27th International Conference on Discovery Science* (DS 2024) Pisa, Italy, October 14-16 2024, presenting the work *Large Language Models-based Local Explanation of Text Classifier* [1].

8   Activities as Reviewer

Participation in program committees

Francesco De Luca is a member of the program committee of:

- AIxIA Workshop on Green-Aware Artificial Intelligence (Green-Aware AI 2024), November 25-28 2024, Bolzano (BZ), Italy

- ADIBIS Workshop on Cooperative AI Models and Applications (CAIMA 2025), September 23 2025, Tampere, Finland.

Reviews for journals

2024 *AI Communications*, The European Journal on Artificial Intelligence. - IOS Press

2024 Scientific Reports.- Springer Nature

Reviews for conferences

2024 ICDM 2024: IEEE International Conference on Data Mining, December 9-12 2024, Abu Dhabi

2024 ECML/PKDD 2024: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases September 9-13 2024, Vilnius

2024 PACKDD 2024: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases May 7-10 2024, Taipei

2025 ICHI 2025: IEEE-International Conference on Healthcare Informatics June 18-21, 2025, Rende

2025 IJCNN 2025: International Joint Conference on Neural Networks June 30 - July 5 2025, Rome

9   Teaching activities

Francesco De Luca has been a teaching assistant in the following courses:

- **Machine and Deep Learning - academic year 2024-2025**, 16 hours, Master's degree in Computer Engineering, DIMES, University of Calabria, Rende (CS). Topics: Linear Models, Support Vector Machines, Advanced Neural Networks (CNN, RNN, GNN, AE, VAE, GAN), Reinforcement Learning, eXplainable Artificial Intelligence - Language and Framework: Python, Keras, PyTorch.

– **- academic year 2023-2024**, 27 hours, Bachelor's Degree in Computer Engineering, DIMES, University of Calabria, Rende (CS). Topics: finite automaton and Karnaugh maps, Accumulator Machine and RTL language, Assembly language.

10   Thesis supervision

Bachelor's Degree

2024 *Large Language Models-based Image Reconstruction for Anomaly Detection.* Bachelor's Degree in Computer Engineering, DIMES, University of Calabria. Candidate: Anna Chiara Bruni. Supervisor: Prof. Fabio Fassetti, Co-supervisor: Dr. Francesco De Luca.

Master's Degree

2025 *Deep Learning Techniques for analysis and classification of electrocardiograms.* Master's Degree in Artificial Intelligence and Computer Science, DEMACS, University of Calabria. Candidate: Giovambattista Crudo. Supervisors: Prof. Valeria Fionda, Prof. Fabio Fassetti, Co-supervisor: Dr. Francesco De Luca.

The undersigned authorizes the processing of data personal pursuant to Legislative Decree 196/2003 and of the GDPR (EU Regulation 679/2016).

Date:
21/07/2025

Signature: