Curriculum Vitae et Studiorum

Simona Nisticò

1 Positions

- From February 2024, *Research Fellow* at DIMES, University of Calabria, Rende (CS), Italy.

- From December 2022 to March 2023, *Visiting Researcher* at Data Science Department, Radboud University, Nijmegen, Netherlands.

- From November 2020 to February 2024, *PhD student* in Information and Communication Technologies at DIMES, University of Calabria, Rende (CS), Italy.

2 Education

- PhD in Information and Communication Technology
  Institution: DIMES, University of Calabria, Rende (CS), Italy.
  Title of the thesis: *Deep Learning Techniques for Explaining Predictors and Abnormal Behaviours.*
  Supervisors: Prof. Fabrizio Angiulli, Prof. Fabio Fassetti.
  Date of achievement: 27/02/2024.

3 Research Activity

Her research interests are in Artificial Intelligence and span multiple topics.

Her work has been mainly focused on Explainable Artificial Intelligence (xAI). In this context, she has explored the enhancement of post-hoc local surrogates-based explanation by leveraging generative networks and Large Lenguage Models (LLMs) for neighbourhood sampling [14, 5]. Simultaneously, she developed an approach using masking models, which are neural networks specialized in transforming samples to change black-box model outcomes, to generate counterfactual explanations [13]. Also, she has explored the use of the analysis of outcome sensitivity to feature modification to extract higher-lever features, useful to improve explanation delivery [6]. Additionally, she has investigated the problem of design models providing explainability, focusing on the Anomaly Detection task.

Over the years, she has also addressed the data explanation problem, which is orthogonal to the task of model explanation, dedicating her efforts to developing a new perspective for the Outlier Explanation (OE) problem. In this context, she proposed the use of transformation-based justifications, simultaneously illustrating how to modify the sample to remove factors contributing to its outlierness and providing the user with a "normal" counterexample. This approach is designed to generate diverse explanations for a single instance, enabling the identification of different facets of sample outlierness [12, 8]. She later extended this approach to an alternative scenario where explanations are generated for a not a priori known group of anomalies, using a hierarchical clustering approach based on explanations fitness to construct anomalies groups [1].

Simona Nisticò has moreover developed research pertaining to other tasks. One of them is Audio Super-resolution, where she proposed a GAN-based approach leveraging vision transformers to generate missing frequencies in corrupted audio recordings [11, 3]. Recently, she has started to delve into Federated

Learning, with a particular focus on model aggregation and personalization problems, as well as Neuro-symbolic approaches for detecting and repairing anomalous evolutions of intelligent agents in planning systems.

4 Professional Activity

Program Committees and Chairmenships

Simona Nisticò is co-organizer and program co-chair of the following workshops:

- CAIMA2025, 1st Workshop on Cooperative AI Models and Applications, co-located with ADBIS 2025 Conference.

- Green-Aware2025, 2nd Workshop on Green-Aware Artificial Intelligence, co-located with ECAI 2025 Conference.

Moreover, Simona Nisticò has been a member of the Program Committee of

- ECML/PKDD, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases from 2024.

- DS 2024, International Conference on Discovery Science 2024.

- HHAI 2025, International Conference Series on Hybrid Human-Artificial Intelligence 2025.

- BING 2024, 1st Workshop on Biomedical Insights with NLP and Graph Analysis.

Reviews for journals and conferences

Simona Nisticò has been a reviewer for the following journals:

- Machine Learning
- Journal of Big Data
- Scientific Report
- Ai Communication
- Computational and Structural Biotechnology

Moreover, she acted as a reviewer for the following conferences: IJCAI, ECML/PKDD, ICDM, SAC, DS, PAKDD

5 List of pubblications

Journals

[1] Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò, and Luigi Palopoli. "Explaining outliers and anomalous groups via subspace density contrastive loss". In: *Machine Learning* (2024), pp. 1–25.

[2] Jamsher Bhanbhro, Simona Nisticò, and Luigi Palopoli. "Issues in federated learning: some experiments and preliminary results". In: *Scientific Reports* 14.1 (2024), pp. 1–15.

[3] Simona Nisticò, Luigi Palopoli, and Adele Pia Romano. "Audio super-resolution via vision transformer". In: *Journal of Intelligent Information Systems* (2023), pp. 1–15.

Book Chapters

[4] Francesco Scarcello, Simona Nisticò, and Luigi Palopoli. "Artificial Intelligence". In: *Reference Module in Life Sciences*. Elsevier, 2024.

Conferences

[5] Fabrizio Angiulli, Francesco De Luca, Fabio Fassetti, and Simona Nisticó. "Large Language Models-Based Local Explanations of Text Classifiers". In: *International Conference on Discovery Science*. Springer. 2024, pp. 19–35.

[6] Luca Ferragina and Simona Nisticò. "A Clustering-based Approach for Interpreting Black-box Models". In: *Proceedings of the 32nd Symposium on Advanced Database Systems, Villasimius, Italy, June 23rd to 26th, 2024, CEUR WORKSHOP PROCEEDINGS*. Vol. 3741. 2024, pp. 595–603.

[7] Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò, and Luigi Palopoli. "Exploiting Outlier Explanation to Unveil Key Aspects of High Green Comparative Advantage Nations." In: *1st Workshop on Green-Aware Artificial Intelligence (Green-Aware2024)*.

[8] Fabrizio Angiulli, Fabio Fassetti, Simona Nisticó, and Luigi Palopoli. "Counterfactuals Explanations for Outliers via Subspaces Density Contrastive Loss". In: *International Conference on Discovery Science*. Springer Nature Switzerland Cham. 2023, pp. 159–173.

[9] Simona Nisticò. "Towards reliable machine learning". In: *European Conference on Advances in Databases and Information Systems*. Springer Nature Switzerland Cham. 2023, pp. 631–638.

[10] Fabrizio Angiulli, Alessandra Del Prete, Fabio Fassetti, and Simona Nisticò. "A Semi-automatic Data Generator for Query Answering". In: *International Symposium on Methodologies for Intelligent Systems*. Springer International Publishing Cham. 2022, pp. 106–114.

[11] Simona Nisticò, Luigi Palopoli, and Adele Pia Romano. "Audio super-resolution via vision transformer". In: *International Symposium on Methodologies for Intelligent Systems*. Springer International Publishing. 2022, pp. 378–387.

[12] Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò, and Luigi Palopoli. "Outlier explanation through masking models". In: *European Conference on Advances in Databases and Information Systems*. Springer International Publishing Cham. 2022, pp. 392–406.

[13] Fabrizio Angiulli, Fabio Fassetti, and Simona Nisticò. "Finding local explanations through masking models". In: *International Conference on Intelligent Data Engineering and Automated Learning*. Springer International Publishing Cham. 2021, pp. 467–475.

[14] Fabrizio Angiulli, Fabio Fassetti, and Simona Nisticò. "Local interpretable classifier explanations with self-generated semantic features". In: *International Conference on Discovery Science*. Springer International Publishing Cham. 2021, pp. 401–410.

[15] Fabio Fassetti, Ilaria Fassetti, and Simona Nisticò. "Stream analysis for detecting stuttering episodes". In: *ExLing 2019* 25 (2019), p. 77.

[16] Fabio Fassetti, Ilaria Fassetti, and Simona Nisticò. "Learning and detecting stuttering disorders". In: *IFIP International Conference on Artificial Intelligence Applications and Innovations*. Springer International Publishing Cham. 2019, pp. 319–330.

Manuscripts

- *Explaining Anomalies through Semi-supervised Autoencoders.* Fabrizio Angiulli, Fabio Fassetti, Luca Ferragina, Simona Nisticò. Submitted for publication.

- *Evolution-aware Outlier Explanation.* Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò, Luigi Palopoli. Submitted for publication.

- *Adversarial Anomaly Explanation.* Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò, Luigi Palopoli. Submitted for publication.

- *Improving Local Interpretable Classifier Explanations exploiting Self-generated Semantic Features.* Fabrizio Angiulli, Fabio Fassetti, Simona Nisticò. Submitted for publication.