

Federico Marcuzzi

Curriculum Vitae

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Education

- 09/2020 **Ph.D. in Computer Science**, *Università Ca' Foscari Venezia*.
- 04/2024 Research Area: Information Retrieval, Adversarial Machine Learning, Fairness in Machine Learning.
- 3/2023 **Guest researcher**, *Universiteit van Amsterdam*, Fairness-aware Learning to Rank.
- 6/2023 Supervisor Andrew Yates, PhD, Assistant Professor.
- 12/2017 **Master of Science degree (M.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*.
- 3/2020 Degree in software dependability and cyber security. 110/110 cum laude.
- 7/2014 **Bachelor of Science degree (B.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*.
- 10/2017 Degree in information technologies and sciences. 108/110.

Doctoral Thesis

title *Effective, Efficient, and Robust Learning Algorithms for Ranking and Classification*

supervisors Prof. Claudio Lucchese

Master's Thesis

title *Robust Tree Ensemble against Adversarial Examples*

supervisors Prof. Claudio Lucchese

Work Experience

- 7/2023 **Research grant**, *Università Ca' Foscari Venezia*.
- present Developing fair and explainable machine learning-based search engines for tourism destinations. Projects of the National Recovery and Resilience Plan (PNRR) - funded by the European recovery programme NextGenerationEU: "iNEST - Interconnected Nord-Est Innovation Ecosystem. Thematic area: Digital, Industry, Aerospace".
- 2/2023 **Self-employment contract**, *Università Ca' Foscari Venezia*.
- 3/2023 Analysis and development of planning services for multimodal mobility based on public transport.
- 5/2021 **Self-employment contract**, *Università Ca' Foscari Venezia*.
- 7/2021 The research project called *Learning to Rank in adversarial context* involved the development of algorithms for identifying instances that have more impact at training time and, therefore, are more subject to adversarial manipulations.
- 5/2020 **Research scholarship**, *Università Ca' Foscari Venezia*.
- 8/2020 The research project called *Adversarial machine learning algorithms for decision tree ensembles* involved the development of interpretable machine learning algorithms based on decision tree ensembles robust to adversarial machine learning attacks.
- 11/2019 **Research scholarship**, *Università Ca' Foscari Venezia*.
- 4/2020 The research project called *Adversarial machine learning algorithms for classification forests* involved the development of both a machine learning classifier based on forests of decision trees robust to evasion attacks and certificates for verifying the robustness of the model.
- 12/2018 **Research scholarship**, *Università Ca' Foscari Venezia*.
- 9/2019 Junior researcher and digital promoter for the project: *PID Industry 4.0: Enterprise 4.0 and Digital Transformation for SMEs, digital maturity analysis*, promoted by the Chamber of Commerce of Venice-Rovigo.

Awards

- ACM SIGIR **SIGIR Student Travel Grant**, *The 45th International ACM SIGIR Conference on Research and Development in Information Retrieval*, July 2022.
- ACM SIGAPP **SIGAPP Student Travel Grant**, *The 38th ACM/SIGAPP Symposium On Applied Computing*, March 2023.

Supervision Experience

- 6/2023 **Master's thesis supervisor**, *Università Ca' Foscari Venezia*.
- ongoing Student: Nicanor Tintari. Research area: Fairness in machine learning. Brief description: Train effective and fair learning-to-rank models by jointly optimizing effectiveness-oriented and fairness-oriented ranking metrics.

Teaching Experience

- 11/2023 **Teaching Assistant Senior**, *Università Ca' Foscari Venezia*.
- 6/2024 Teaching Assistant Senior for the *Programming and Laboratory* course of the bachelor's degree in computer science.
- 12/2022 **Teaching Assistant Senior**, *Università Ca' Foscari Venezia*.
- 6/2023 Teaching Assistant Senior for the *Programming and Laboratory* course of the bachelor's degree in computer science.
- 12/2022 **Teaching Assistant Senior**, *Università Ca' Foscari Venezia*.
- 6/2023 Teaching Assistant Senior for the *Introduction to Programming* course of the bachelor's degree in computer science.
- 5/2022 **Self-employment contract**, *Università Ca' Foscari Venezia*.
- 6/2022 Design and development of teaching materials and software for the use of supervised and unsupervised machine learning methods.
- 2/2022 **University Tutor**, *Università Ca' Foscari Venezia*.
- 6/2022 University tutor for the *Programming and Laboratory* course of the bachelor's degree in computer science.
- 9/2021 **University Tutor**, *Università Ca' Foscari Venezia*.
- 1/2022 University tutor for the *Introduction to Programming* course of the bachelor's degree in computer science.
- 9/2021 **Self-employment contract**, *Università Ca' Foscari Venezia*.
- 11/2021 Design and development of teaching materials and software for programming in Python language and data manipulation.
- 2/2021 **University Tutor**, *Università Ca' Foscari Venezia*.
- 6/2021 University tutor for the *Programming and Laboratory* course of the bachelor's degree in computer science.
- 12/2020 **Teaching Assistant Senior**, *Università Ca' Foscari Venezia*.
- 6/2021 Teaching Assistant Senior for the *Introduction to Programming* course of the bachelor's degree in computer science.
- 7/2019 **Summer School Tutor**, *Università Ca' Foscari Venezia*.
- 8/2019 Support tutor at Ca' Foscari summer school of algorithms. The summer school prepared selected students from Venetian secondary schools for the Italian Olympiad in Informatics (2018/2019). The topics covered during the lectures were an introduction to computational complexity, recursion, greedy algorithms, graphs, and fundamental graph algorithms.
- 3/2019 **University Tutor**, *Università Ca' Foscari Venezia*.
- 5/2019 University tutor for the *Programming* course of the bachelor's degree in computer science.

Publications

- RAIE **T. Scantamburlo, P. Falcarin, A. Veneri, A. Fabris, C. Gallese, V. Billa, F. Rotolo, F. Marcuzzi**, *Software Systems Compliance with the AI Act: Lessons Learned from an International Challenge*, Proceedings of the 2nd ACM International Workshop on Responsible AI Engineering, April 2024, <https://doi.org/10.1145/3643691.3648589>.
- CIKM **F. Marcuzzi, C. Lucchese, S. Orlando**, *LambdaRank Gradients are Incoherent*, Proceedings of the 32nd ACM International Conference on Information and Knowledge Management, October 2023, <https://doi.org/10.1145/3583780.3614948>.

- IIR **C. Lucchese, F. Marcuzzi, S. Orlando**, *Does LambdaMART Do What You Expect? (Abstract)*, Proceedings of the 13th Italian Information Retrieval Workshop (IIR 2023), June 2023, <https://ceur-ws.org/Vol-3448/paper-16.pdf>.
- SAC **C. Lucchese, F. Marcuzzi, S. Orlando**, *On the Effect of Low-Ranked Documents: A New Sampling Function for Selective Gradient Boosting*, Proceedings of the 38th ACM/SIGAPP Symposium On Applied Computing, March 2023, <https://doi.org/10.1145/3555776.3577597>.
- SaTML **S. Calzavara, L. Cazzaro, C. Lucchese, F. Marcuzzi**, *Explainable Global Fairness Verification of Tree-Based Classifier*, IEEE Conference on Secure and Trustworthy Machine Learning, February 2023, <https://doi.org/10.1109/SaTML54575.2023.00011>.
- ICTIR **F. Marcuzzi, C. Lucchese, S. Orlando**, *Filtering out Outliers in Learning to Rank*, Proceedings of the 8th ACM SIGIR International Conference on Theory of Information Retrieval, August 2022, doi.org/10.1016/j.cose.2022.102843.
- IIR **F. Marcuzzi, C. Lucchese, S. Orlando**, *SOUR: an Outliers Detection Algorithm in Learning to Rank (Abstract)*, 12th Italian Information Retrieval Workshop 2022 (IIR 2022). Proceedings of the CEUR Workshop Proceedings (CEUR-WS.org, ISSN 1613-0073), June 2022, ceur-ws.org/Vol-3177/paper12.pdf.
- Computers & Security **S. Calzavara, L. Cazzaro, C. Lucchese, F. Marcuzzi, S. Orlando**, *Beyond robustness: Resilience verification of tree-based classifiers*, Computers & Security, October 2022, doi.org/10.1016/j.cose.2022.102843.
- EURASIP **S. Calzavara, C. Lucchese, F. Marcuzzi, S. Orlando**, *Feature Partitioning for Robust Tree Ensembles and their Certification in Adversarial Scenarios*, EURASIP Journal on Information Security, December 2021, doi.org/10.1186/s13635-021-00127-0.

Languages

Italian Native
English Fluent (both writing and speaking)