

Federico Marcuzzi

Curriculum Vitae

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Education

- 09/2020 **Philosophiae Doctor (Ph.D) in Computer Science**, *Università Ca' Foscari Venezia*, Ph.D in Learning to Rank.
- 12/2017 **Master of Science degree (M.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*, Degree in machine learning and cyber security.
3/2020 GPA: 4.0
- 7/2014 **Bachelor of Science degree (B.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*.
10/2017 GPA: 4.0

Master Thesis

- title *Robust Tree Ensemble against Adversarial Examples*
- supervisors Prof. Claudio Lucchese
- description We developed an ensemble learning algorithm based on decision trees robust to evasion attacks with L_0 -norm budget constraint. In addition, We provided two lower-bound certifications of model robustness.

Publications

- 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.
- 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.
- 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.
- 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.
- 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, openreview.net/pdf?id=HOu7LgqCTqd.
- 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.

Awards

- ACM SIGIR **SIGIR Student Travel Grant**, *The 45th International ACM SIGIR Conference on Research and Development in Information Retrieval*, July 2022.

Research Activity

- 2/2023 **Research Assistant**, *Università Ca' Foscari Venezia.*
- 3/2023 Analysis and development of planning services for multimodal mobility based on public transport.
- 5/2021 **Research Assistant**, *Università Ca' Foscari Venezia.*
- 7/2020 The research project called *Learning to Rank in adversarial context* involved the development of algorithms for identifying instances which have more impact at training time and therefore more subject to adversarial manipulations.
- 5/2020 **Research Assistant**, *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 Assistant**, *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 Assistant**, *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.

Work Experience

- 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 **Teacher**, *Università Ca' Foscari Venezia & Digital Innovation Hub Vicenza.*
- 6/2022 Teacher for the course: *Design and Development of Educational Material and Software for the use of supervised and unsupervised methods of machine learning*
- 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 **Teacher**, *Digital Innovation Hub Vicenza.*
- 9/2021 Teacher for the course: *Artificial intelligence course for enterprises*. The course included an introduction to machine learning and its application to the industry.
- 3/2021 **Teacher**, *Università Ca' Foscari Venezia & Digital Innovation Hub Vicenza.*
- 4/2021 Teacher for *Introduction to Big Data and Python programming* course. The main topics covered by the course were: introduction to Big Data and Open Data and how to use data manipulation and visualisation tools in Python programming language. The course was divided into 7 two-hour lessons to lead students to manipulate Big Data and propose their correct visualisation autonomously.
- 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 has prepared some students of Venetian secondary schools, for the Italian Olympiad in Informatics (2018/2019). The topics covered during the lessons are an introduction to computational complexity, recursion, greedy algorithms, graphs/fundamental algorithms on graphs and exercises on the previous problems of the Olympics.
- 3/2019 **University Tutor**, *Università Ca' Foscari Venezia*.
- 5/2019 University tutor for the *Programming* course of the bachelor's degree in computer science.

Languages

Italian Native
English Academic