Federico Marcuzzi

Curriculum Vitae

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Education

09/2020 present	**Philosophiæ Doctor (Ph.D) in Computer Science**, *Università Ca' Foscari Venezia*, Ph.D in Learning to Rank.
12/2017 3/2020	**Master of Science degree (M.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*, Degree in machine learning and cyber security. GPA: 4.0
7/2014 10/2017	**Bachelor of Science degree (B.Sc.) in Computer Science**, *Università Ca' Foscari Venezia*. 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 2022 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, Fabruary 2023, arxiv.org/pdf/2209.13179.pdf.

Rresearch Activity

5/2021 7/2020	**Research Assistant**, *Università Ca' Foscari Venezia*. 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 of Università Ca' Foscari Venezia for the *PID Industry 4.0: Enterprise 4.0 and Digital Transformation for SMEs, digital maturity analysis* project, promoted by the Chamber of Commerce of Venice-Rovigo.

Work Experience

9/2021	**Teacher**, *Digital Innovation Hub Vicenza*.
9/2021	Teacher for the *Artificial intelligence course for enterprises* course. The course included an introduction to machine learning and how it can be applied to the industry.
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.
	○ preparation of teaching material
	○ examination surveillance
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 autonomously manipulate Big Data and propose their correct visualisation.
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.
	○ students assistance through an online forum
	○ correction of weekly exercises
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.
	○ preparation of teaching material
	○ examination surveillance
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: 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.
	○ student support during class hours
	○ individual reception service for the student
	○ correction of weekly exercises

Languages

Italian	Native
English	Academic