



Giordano d'Aloisio

Education

- 2007–2013 **Licenza Scientifica**, *Liceo Scientifico Galileo Galilei*, Pescara, 82/100.
- 2013–2016 **Bachelor Degree**, *University of Chieti-Pescara*, Pescara, 110/110 cum laude.
Bachelor Degree in Economia e Informatica per l'Impresa. Thesis: *Sviluppo Applicazione Web per Registro Elettronico*
- 2019–2020 **Master in Mobile and Web Technologies**, *University of L'Aquila*, L'Aquila, 70/70 cum laude.
- 2018–2021 **Master Degree**, *University of L'Aquila*, L'Aquila, 110/110 cum laude.
Master Degree in Computer Science. Thesis: *Approach to design Data Science Pipeline with High Quality*
- 2021–now **PhD Student in Information and Communication Technology**, *University of L'Aquila*, L'Aquila.
- 2024 **Visiting Researcher**, *University College London*, London.
Five months visiting researcher at the Department of Computer Science under the supervision of Prof. Federica Sarro

Working Experience

- 2017–2018 **Web Developer**, *UDANET S.R.L.*, Torrevicchia Teatina, Chieti.
- 2019–2021 **Research Scholarship for the Territori Aperti project**, *University of L'Aquila*, L'Aquila.
<https://territoriaperti.univaq.it>
- 2020–2023 **Tutor for the PinKamP project**, *University of L'Aquila*, L'Aquila.
<http://pinkamp.disim.univaq.it/>
- 2020–2021 **Tutor for the Coding Girls Italia project**, *Fondazione Mondo Digitale*.
<https://mondodigitale.org/it>

Language Skills

Italiano Mother Tongue
English B2 level

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	B2	B2	B2	B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

Programming Skills

Web Development Wordpress, PHP, HTML5, CSS, Laravel framework, React and Redux, Java and Spring Framework

Data Science Python and Data Science libraries (e.g., pandas, numpy, etc.), Machine learning and related libraries (e.g., sklearn), Visualization libraries (e.g., matplotlib, seaborn)

Research Interests

- Algorithmic Bias and Fairness
- Software Engineering for Machine Learning
- Quality in Machine Learning
- Diversity, Equity and Inclusion in Software Engineering

Activity Coordination in Scientific Projects

2019–now **Territori Aperti**, *University of L'Aquila*, L'Aquila.

Responsible for activity 1.4 (Data Accumulation) and collaboration on the organisation of various events conducted as part of the project. Territori Aperti is a national project (funded by Fondo Territori Lavoro Conoscenza CGIL CISL UIL) dealing with reconstruction processes after natural disasters. The project aims, among the others objectives, to realize an information system of data coming from main earthquakes in Italy, to provide a research virtual environment where to run data analysis (based on machine learning techniques and statistical models) and to specify guidelines to guide in future events..

Talks

Presentations As a PhD Student, I participated as a speaker at the following conferences and workshops:

- 12th Workshop on Information Logistics and Digital Transformation - ILOG 2021 (*online*)
- Third International Workshop on Algorithmic Bias in Search and Recommendation - BIAS 2022 (*Stavanger, Norway*)
- 44th International Conference on Software Engineering Doctoral Symposium - ICSE DS 2022 (*online*)
- Lipari School on Computational Complex and Social Systems - Lipari 2022 (*Lipari, Italy*)
- 8th Italian Conference on ICT for Smart Cities And Communities - I-CITIES 2022 (*Ascoli Piceno, Italy*)
- 26th International Conference on Fundamental Approaches to Software Engineering - FASE 2023 (*Paris, France*)
- EMELIOT Workshop 2023 (*Salerno, Italy*)
- 17th European Conference on Software Architecture - ECSA 2023 (*Istanbul, Turkey*)
- Workshop on Algorithmic Biases in Artificial Intelligence from Interdisciplinary Perspectives - AI-Gap 2023 (*L'Aquila, Italy*)
- Resilienza ai Disastri e Sviluppo Sostenibile - National Conference of Territori Aperti in Collaboration with SoBigData RI (*Naples, Italy*)

Seminars As a PhD Student, I held the following seminars:

- Seminar on Bias e Fairness in Machine Learning for the Programming for Data Science master course - 2021
- Seminar on Bias e Fairness in Machine Learning for the Machine Learning for Model Driven Engineering master course - 2022
- Seminar on Bias e Fairness in Machine Learning for the PinKamP project - 2023
- Seminar on web development in WordPress for the PinKamP project - 2022-2023
- Seminar on Software Engineering approaches to democratise the development of fair Machine Learning systems for the DATA Research Group seminars cycle - 2023
- Seminar on approaches to predict the training time of Machine Learning models for the DATA Research Group seminars cycle - 2023

Service in Conferences, Journals and Schools

- Sub-Reviewer
- CAIML 2022
 - FASE 2023
 - ICDM 2023
 - ICPE 2023
 - IPM journal

- Program
 - BIAS Workshop 2022
- Committee
 - BIAS Workshop 2023
- Member
 - ISSTA 2023 Artifact Evaluation
 - ISSTA 2024 Artifact Evaluation

- Journal
 - Expert Systems with Applications
- Reviewer
 - Future Generation Computer Systems

- Web Chair
 - ICPE 2024
 - Resilienza ai Disastri e Sviluppo Sostenibile - National Conference of Territori Aperti in collaboration with SoBigData RI

- Student
 - ICSA 2023
- Volunteer
- Training
 - Member of the organising committee for the PinKamP project. PinKamP is a project that aims to attract high school girls and to contrast the gender gap in STEM studies through a two-week summer school.
- Schools

- Other
 - Co-organiser of the DATA Research Group seminars cycle at the University of Activities L'Aquila that aims to the dissemination of various research projects in the field of Data Science and Machine Learning.

Participation in Scientific Projects

As a PhD Student, I have been involved in the following Italian and European scientific projects:

2019–now **Territori Aperti.**

Territori Aperti is a national project (funded by Fondo Territori Lavoro Conoscenza CGIL CISL UIL) dealing with reconstruction processes after natural disasters. The project aims, among the others objectives, to realize an information system of data coming from main earthquakes in Italy, to provide a research virtual environment where to run data analysis (based on machine learning techniques and statistical models) and to specify guidelines to guide in future events.

2020–now **PinKamP.**

PinKamP is a project that aims to attract high school girls and to contrast the gender gap in STEM studies through a two-week summer school.

2019–now **SoBigData++.**

SoBigData++ strives to deliver a distributed, Pan-European, multi-disciplinary research infrastructure for big social data analytics, coupled with the consolidation of a cross-disciplinary European research community, aimed at using social mining and big data to understand the complexity of our contemporary, globally-interconnected society. Pushing the FAIR and FACT principles further, SoBigData++ render social mining experiments more easily designed, adjusted and repeatable by domain experts that are not data scientists. SoBigData++ advances from the awareness of ethical and legal challenges to concrete tools that operationalise ethics with value-sensitive design, incorporating values and norms for privacy protection, fairness, transparency and pluralism.

2021–now **SoBigData.it.**

The SoBigData.it project aims to strengthen the Italian node of the SoBigData research infrastructure (www.sobigdata.eu), with the goal of enhancing interdisciplinary and innovative research on the multiple aspects of social complexity by combining data and model-driven approach. SoBigData.it is coordinated by CNR-ISTI and supported by European Union – NextGenerationEU – National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, PNRR) – Project: “SoBigData.it – Strengthening the Italian RI for Social Mining and Big Data Analytics” – Prot. IR0000013 – Avviso n. 3264 del 28/12/2021

2022 **FairEdu.**

FairEdu aims at analysing the issue of gender bias in academic promotions within the Software Engineering and Informatics Italian communities.

2022 **Data-quality-driven estimation of computational complexity of Machine Learning systems.**

This project aims to investigate and formalize the computational complexity of ML models by taking into account features related to dataset quality, such as unbalanced data, missing data, categorical or continuous data, among others. The goal is to develop data quality driven methods that can accurately select the best ML models to reduce energy consumption in advance.

2022–now **EMELIOT.**

Project EMELIOT (Engineered Machine Learning-intensive IoT systems) studies solutions for engineering highly-dependable, ML-intensive IoT systems. EMELIOT foresees systems where different sensors collect data from physical systems, which in turn can get their status changed by actuators. Collected data are filtered, aggregated, and used to manage ML models locally, on the edge, by dedicated IoT gateways, or on remote cloud servers. This flexibility allows for diverse solutions and can take care of different processes - responsibility, latency issues, and privacy concerns - since the amount of data to move can be adjusted and data can be analyzed locally. The overarching goal of the project is to provide software engineers, data scientists, and ML experts a comprehensive set of methodologies, solutions, and tools to improve the development, verification, and operation of ML-intensive IoT systems.

2023–now **Fringe.**

Project FRINGE (*context-aware Fairness engineering in complex software systems*) studies solutions for engineering software fairness in the context of ML-intensive systems. FRINGE foresees systems where data are continuously collected through heterogeneous interconnected smart devices and real-time monitoring devices. Collected data are filtered, aggregated, and consumed by ML models. The large amount of data available, the interconnection among them, and the continuous data acquisition/learning activities raise serious ethical concerns, as it is hard to verify that ML models act according to ethical principles and make predictions that do not perpetuate discrimination toward sensitive groups. The overarching goal of the project is to provide software engineers, data scientists, and ML experts with a comprehensive set of methodologies, approaches, and software engineering (SE) solutions to improve the development, monitoring, and design of fairness-related properties of ML-intensive systems.

Participation in Summer Schools

As a PhD student I have attended the following winter and summer schools:

2022 **Winter School on Software Engineering**, Faculty of Computer Science, Moscow State University, Online.

2022 **Bertinoro International Spring School "BISS 2022"**, Online.

- 2022 **Lipari School on Computational Complex and Social Systems**, *Jacob T. Schwartz International School for Scientific Research*, Lipari, Italy.
- 2022 **5th Advanced Online & Onsite Course on Data Science & Machine Learning - ACDL 2022**, Certosa di Pontignano, Siena, Italy.
- 2023 **First International Summer School on Software Engineering for Digital Society**, Giulianova, Teramo, Italy.

Participation in Other Events

- 2024 **66th CREST Open Workshop - SSBSE Challenge Track: Collaborative Jam Session**, King's College London, London, UK.

Teaching

- A.Y. 2022–2023 **Tutor for the course on Programming for Data Science (4 hours)**, *University of L'Aquila*, L'Aquila.
Master degree in Applied Data Science
- A.Y. 2021–2022 **Tutor for the course on Abilità Informatiche (4 hours)**, *University of L'Aquila*, L'Aquila.
Scuole di Specializzazione Medica
- A.Y. 2022–2023 **Tutor for the course on Abilità Informatiche (4 hours)**, *University of L'Aquila*, L'Aquila.
Scuole di Specializzazione Medica
- A.Y. 2023–2024 **Teaching Assistant for the course on Laboratorio di Programmazione (20 hours)**, *University of L'Aquila*, L'Aquila.
 - Bachelor degree in Computer Science
 - Bachelor degree in Mathematics

Publications

Journals

- [1] Giordano d'Aloisio, Claudio Di Sipio, Antiniscia Di Marco, and Davide Di Ruscio. How fair are we? from conceptualization to automated assessment of fairness definitions. *Software and Systems Modeling (under review)*, 2023.
- [2] Andrea D'Angelo, Giordano d'Aloisio, Francesca Marzi, Antiniscia Di Marco, and Giovanni Stilo. Uncovering gender bias in academia: A comprehensive analysis within the software engineering community. *Journal of Systems and Software (under review)*, 2023.
- [3] Donato Di Ludovico, Chiara Capannolo, and Giordano d'Aloisio. The toolkit disaster preparedness for pre-disaster planning. *International Journal of Disaster Risk Reduction*, 96:103889, 2023.
- [4] Giordano d'Aloisio, Andrea D'Angelo, Antiniscia Di Marco, and Giovanni Stilo. Debiasser for multiple variables to enhance fairness in classification tasks. *Information Processing & Management*, 60(2):103226, 2023.

Conferences

- [1] Giordano d'Aloisio. Quality-driven machine learning-based data science pipeline realization: a software engineering approach. In *Proceedings of the ACM/IEEE 44th International Conference on Software Engineering: Companion Proceedings*, pages 291–293, 2022.
- [2] Giordano d'Aloisio, Andrea D'Angelo, Francesca Marzi, Diana Di Marco, Giovanni Stilo, and Antinisca Di Marco. Data-driven analysis of gender fairness in the software engineering academic landscape. In *European Conference on Software Architecture - ECSA, 2023*.
- [3] Giordano d'Aloisio, Antinisca Di Marco, and Giovanni Stilo. Democratizing quality-based machine learning development through extended feature models. In *Fundamental Approaches to Software Engineering: 26th International Conference, FASE 2023, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2023, Paris, France, April 22–27, 2023, Proceedings*, pages 88–110. Springer Nature Switzerland Cham, 2023.

Workshops

- [1] Andrea Bianchi, Giordano d'Aloisio, Francesca Marzi, and Antinisca Di Marco. A decision tree to shepherd scientists through data retrievability. *Second Workshop on Reproducibility and Replication of Research Results (RRRR)*, 2023.
- [2] Andrea Bianchi, Giordano d'Aloisio, Antinisca Di Marco, and Giovanni Stilo. Enabling trustworthy predictions using ai, ml and multi-modal data. *Italian Conference on System and Service Quality (QUALITA 2022)*, 2022.
- [3] Andrea Bianchi, Giordano d'Aloisio, Andrea D'Angelo, Antinisca Di Marco, Alessandro Di Matteo, Jessica Leone, Giulia Scoccia, Giovanni Stilo, and Luca Traini. Diorama: Digital twin for sustainable territorial management. *1st Italian Conference on Big Data and Data Science (ITADATA 2022)*, 2022.
- [4] Francesca Caroccia, Damiano D'Agostino, Giordano d'Aloisio, Antinisca Di Marco, and Giovanni Stilo. Sismadl: an ontology to represent post-disaster regulation. In *12th Workshop on Information Logistics and Digital Transformation (ILOG 2021)*, 2021.
- [5] Giordano d'Aloisio, Antinisca Di Marco, and Giovanni Stilo. Modeling quality and machine learning pipelines through extended feature models. *arXiv preprint arXiv:2207.07528*, 2022.
- [6] Giordano d'Aloisio, Antinisca Di Marco, Giovanni Stilo, and Donato Di Ludovico. Indices for enhancing city sustainability. *8th Italian Conference on ICT for Smart Cities And Communities (I-CITIES 2022)*, 2022.
- [7] Giordano d'Aloisio, Giovanni Stilo, Antinisca Di Marco, and Andrea D'Angelo. Enhancing fairness in classification tasks with multiple variables: A data-and model-agnostic approach. In *International Workshop on Algorithmic Bias in Search and Recommendation*, pages 117–129. Springer, 2022.

- [8] Francesca Marzi, Giordano d'Aloisio, Antinisca Di Marco, and Giovanni Stilo. Towards a prediction of machine learning training time to support continuous learning systems development. *International Workshop on Quality in Software Architecture - QUALIFIER*, 2023.

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