



Alessandro Trenta

Curriculum Vitae

Personal Details

Name Alessandro Trenta
Birth date 15/01/1998
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Nationality Italian

Experience

2022–2023 **Data scientist**, *Electra Vehicles*, Turin - Pisa (remote)
Research and Development on AI and Machine learning algorithms coupled with Physics models for the study and prediction of EV batteries behavior and aging. Lead of the fault detection and prediction project. Developed an algorithm to predict cell degradation knee-points and catastrophic faults. Created a system able to learn and predict the driver's usage and consumption patterns of the EV.

2019–2022 **Part time collaboration**, *Scuola Normale Superiore*, Pisa
Administration and maintenance of the computer rooms of Fermi college of Scuola Normale Superiore (Debian GNU/Linux)

2021–2022 **Part time collaboration**, *Università di Pisa*, Pisa
Students tutoring for the "Analisi Dati" course by prof. Romito. Machine learning both under theoretical and practical approach (R, Python, Tensorflow, Pytorch). Seminar on "Overfitting and Double Descent Curve in Neural Networks".

Education

2023–Present **PhD**, *University of Pisa - PhD AI Society*, Pisa
National PhD in Artificial intelligence with full grant by University of Pisa. Mathematics and Machine Learning.

2020–2023 **Master degree in Mathematics**, *Università di Pisa*, Pisa, 110/110 cum Laude
Advanced probability, statistics, data science and machine learning, mathematics of finance, intelligent systems for pattern recognition.

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- 2017–Present **Master degree in Mathematics**, *Scuola Normale Superiore*, Pisa
Information theory and dynamical systems, quantitative finance, quantum information theory, statistical and machine learning models for time series analysis, explainable artificial intelligence.
- 2017–2020 **Bachelor degree in Mathematics**, *Scuola Normale Superiore*, Pisa, 110/110 cum Laude
- 2012–2017 **Secondary School**, *Liceo Scientifico delle Scienze Applicate G. Galilei*, Crema (CR), 100/100 cum Laude
- 2017 **Stage "Ad un passo dalle IPhO"**, *AIF*, ICPT, Trieste
- 2015-2016- **Stage on the Mathematics Olympiad**, *UMI*
- 2017 6 Stages held in Pisa (PI) organized by the Olympic Group of UMI (Italian Mathematicians Union) in preparation for the International Mathematical Olympiad (IMO)
- 2016 **Stage on the Physics Olympiad**, *AIF*
Stage held in Sigillo (PG) organized by the Olympic Group of AIF (Italian association for the teaching of Physics)

Publications

- 2025 S. Heilig, A. Gravina, **A. Trenta**, C. Gallicchio, D. Bacciu "Port-Hamiltonian Architectural Bias for Long-Range Propagation in Deep Graph Networks", ICLR 2025
- 2024 **A. Trenta**, D. Bacciu, A. Cossu, P. Ferrero, "MultiSTOP: Solving Functional Equations with Reinforcement Learning", ICLR 2024 Workshop on AI4Differential Equations In Science
- 2022 **A. Trenta**, D. Bacciu, A. Cossu, P. Ferrero, "BootSTOP: Reinforcement Learning for Conformal Field Theories", Master thesis, University of Pisa

Master thesis

- title Reinforcement Learning for Conformal field theories
- Supervisor Prof. Davide Bacciu (CS @ University of Pisa), Dr. Andrea Cossu (CS @ University of Pisa), Dr. Pietro Ferrero (Ph @ Stonybrook University)
- description Application of Reinforcement Learning to the conformal bootstrap equation of Conformal Field Theories. The algorithm, BootSTOP, is an extension of Soft Actor-Critic and it is applied on the 2D Ising model and the 1D defect CFT defined on the half-BPS Wilson line in the 4D supersymmetric Yang-Mills theory.

Bachelor thesis

- title Teoria dell'informazione, predizione e portafogli universali
- title (EN) Information theory, prediction and universal portfolios
- Supervisor Prof. Stefano Marmi (Scuola Normale Superiore)
- description Applications of information theory concepts and tools (Shannon entropy, universal prediction algorithms, universal codes) to the financial market following the work by Cover, Thomas, Algoet

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Awards

Physics Olimpiad

- 2016/2017 Gold medalist at the National Physics Olympiad. Part of the Italian national team and Bronze medalist at the 48th International Physics Olympiad (IPhO) in Yogyakarta, Indonesia.
- 2015/2016 Bronze medalist at the National Physics Olympiad.

Individual Mathematics Olympiad

- 2016/2017 Gold medalist at the National Mathematics Olympiad. Participation at the final phase of the Math games of Università Bocconi
- 2015/2016 Silver medalist at the National Mathematics Olympiad. Participation at the final phase of the Math games of Università Bocconi. Participation at the final phase of Kangourou of Mathematics
- 2014/2015 Bronze medalist at the National Mathematics Olympiad. Participation at the final phase of the Math games of Università Bocconi. Participation at the final phase of Kangourou of Mathematics

Team Mathematics Olympiad

- 2016/2017 Participation at the national phase of the Italian Team National Olympiad
- 2015/2016 Participation at the national phase of the Italian Team National Olympiad
- 2014/2015 Participation at the national phase of the Italian Team National Olympiad

Informatics Olympiad

- 2020 Participation at the regional phase of ICPC 2020 held in Paris
- 2016 Participation at the national finals of the National Informatics Olympiad

Events and Participations

- 2022 **First Ascent Business**, Barcellona
Participation at the First Ascent Business 2020 event in Barcellona from March 24, 2022 to March 27, 2022. First Ascent Business is an all-expences paid experience for top 20 selected italian students in business and tech to learn, network and impress. website: business.firstascent.io

Computer skills

- Basic Bash, Docker
- Intermediate HTML, \LaTeX , OpenOffice, Office, Linux, Debian, JavaScript ES6, CSS, MatLab, Django framework, R, OpenAI Gym
- Advanced C/C++, python, Tensorflow, Ray library, Ray RLLib

Languages

- Italian Mother tongue
- English C1, CAE certificate passed at grade B in 2016 *Grade 195/210*
- French B1, French class at Scuola Normale Superiore - No certification

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Interests

- Programming, Informatics, Mathematics, Machine learning
- Basketball, football, motorsports
- Videogames, tech

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According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV and application for recruiting purposes.

January 27, 2025

Alessandro Trenta

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