Francesca Cairoli

Personal Details

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Research Interests

My research focuses on the **safety assurance** of **autonomous systems**, strategically integrating the scalability of machine learning with the rigorous, verifiable guarantees of formal methods.

The core of my approaches leverages **scientific machine learning** and **neuro-symbolic** techniques to embed structured domain knowledge and safety constraints directly into the learning process. This principled integration is designed to significantly enhance model **robustness**, **generalisation**, and **interpretability**. Key directions involve employing **deep generative models** to analyse and reason about complex, **stochastic systems**, coupled with the development of efficient, statistically grounded **quantifications of uncertainty**. These methodological foundations are crucial for certifying reliable and trustworthy performance in **safety-critical** applications.

Keywords: Safety Assurance; Autonomous Systems; Scalability; Machine Learning; Formal Methods; Generative AI; Stochastic Systems; Scientific Machine Learning; Neuro-Symbolic AI; Uncertainty Quantification.

Academic Employment

- **Junior Assistant Professor (RTD-A)** from March 2023

  S.S.D. INFO-01/A – Department of Mathematics, Informatics and Geoscience, University of Trieste (Italy)

  Project: EU PNRR *iNEST*: Interconnected Nord-Est Innovation Ecosystem; Spoke 9 – Models, Methods, Computing Technologies for Digital Twin.

- **Research Fellowship** March 2022 - Feb. 2023

  Department of Mathematics and Geoscience, University of Trieste (Italy)

Project: PRIN 2017 *SEDUCE* – Machine Learning for the Verification and Synthesis of Cyber-Physical Systems
Supervisor: Luca Bortolussi

- **Research Fellowship** July 2017 - July 2018

  Department of Engineering and Architecture, University of Trieste (Italy)

  Project: POR FESR 2014-2020 in collaboration with Generation Byte – MDCLS: Dynamical Models for Multi-Device Closed-Loop System
  Supervisor: Felice Andrea Pellegrino

Education

- **PhD in Computer Science** Nov. 2018 - Oct. 2022

  PhD course in "Earth Science, Fluid-Dynamics and Mathematics. Interactions and Methods.", University of Trieste (Italy)

  Research field: Computational and data-based modeling
  Thesis title: "Deep Learning for Abstraction, Control and Monitoring of Complex Cyber-Physical Systems".
  Supervisor: Luca Bortolussi
  Grade: Excellent Cum Laude

- **Master Degree in Mathematics** Oct. 2014- March 2017

  University of Trieste (Italy)

  Thesis title: "Non-linear whole-genome analysis of DNA methylation fidelity".
  Supervisor: Luca Bortolussi.
  Grade: 110/110L

- **Bachelor Degree in Mathematics** Sept. 2010- July 2013

  University of Milano-Bicocca (Italy)

  Thesis title: "Applicazioni computazionali delle basi di Groebner su equazioni polinomiali".
  Supervisor: Andrea Previtali
  Grade: 104/110

- **High School** Sept. 2005- July 2010

  Liceo Scientifico "Enrico Fermi", Cantù (Italy)

  Grade: 95/100

Research and Study Visits

- **Scientific Collaboration** May 2023-Aug. 2023

  University of Southern California, Department of Computer Science, CPS-Vida Lab, Los Angeles (California, USA)

- **Scientific Collaboration** Feb. 2022-Mar. 2022

  University of Konstanz, Department of Computer Science and Centre for the Advanced Study of Collective Behaviour, Konstanz (Germany)

- **PhD Collaboration** Jan. 2020-Feb. 2020

  Royal Holloway University, Department of Computer Science, London (U.K.)

- **Master Thesis Collaboration** Oct. 2016

  Saarland University, Department of Modeling and Simulation, Saarbrucken (Germany)

- **Erasmus Program** Sept. 2012- March 2013

  Graz University of Technology (Austria)

Research Groups

- Member of the **AI Lab** at the **University of Trieste** (Department of Informatics) led by prof. Luca Bortolussi. The group's areas of interest are machine learning and explainable artificial intelligence. The lab also has several industry collaborations.
- Collaborator of the **CPS-Vida Lab** at the **University of Southern California** led by Jyotirmoy Deshmukh. The group's research interests lie in the intersection of formal methods, control theory, cyber-physical systems, and artificial intelligence.
- Collaborator of the **CPS Safety Assurance** group at **King's College London** led by Nicola Paoletti. The main research interest of the group is the design CPSs that are provably correct.
- Former member of the **Control Theory** group at **University of Trieste** (Department of Engineering) led by Felice Andrea Pellegrino. The main research interests of the group are control theory, robotics and machine learning.

Bibliometrics

Data as of September 2nd, 2025.

Platform	Citations	H-index	i10-index	Documents
Google Scholar	213	8	6	n/a
Scopus	124	7	n/a	25

Peer-Reviewed Publications

- **Cairoli, F.**; Bortolussi, L. *Scalable and reliable stochastic parametric verification with stochastic variational smoothed model checking.* International Journal of Systems Science, 1-29, 2025. https://doi.org/10.1080/00207721.2025.2490618

- **Cairoli, F.**; Kuipers, T.; Bortolussi, L.; Paoletti, N. *Conformal quantitative predictive monitoring of stochastic systems with conditional validity*. Nonlinear Analysis: Hybrid Systems, 57, 101606, 2025. https://doi.org/10.1016/j.nahs.2025.101606

- **Cairoli, F.**; Anselmi, F.; d'Onofrio, A.; Bortolussi, L. *Generative abstraction of Markov population processes*. Theoretical Computer Science, 977, 114169, 2023. https://doi.org/10.1016/j.tcs.2023.114169

- Anselmi, F.; Manzoni, L.; D'onofrio, A.; Rodriguez, A.; Caravagna, G.; Bortolussi, L.; **Cairoli, F.**. *Data symmetries and Learning in fully connected neural networks*. IEEE Access, 11, 47282-47290, 2023. https://doi.org/10.1109/ACCESS.2023.3274938

- Bortolussi, L.; **Cairoli, F.**; Paoletti, N.; Smolka, S. A.; Stoller, S. D.; *Neural predictive monitoring and a comparison of frequentist and Bayesian approaches*; International Journal on Software Tools for Technology Transfer, 1-26, 2021, Springer Berlin Heidelberg. https://doi.org/10.1007/s10009-021-00623-1

- **Cairoli, F.**; Fenu, G.; Pellegrino, F. A.; Salvato, E.; *Model Predictive Control of Glucose Concentration Based on Signal Temporal Logic Specifications with Unknown-Meals Occurrence*; Cybernetics and Systems 51 4, 426-441, 2020, Taylor & Francis. https://doi.org/10.1080/01969722.2020.1758463

- Pearson, N.A.; Zanello, F.; Russo, D.; Bortolussi, L.; **Cairoli, F.**; *CoCAI: Copula-based Conformal Anomaly Identification for Multivariate Time-Series*. Accepted at International Conference on Runtime Verification, 2025.

- **Cairoli, F.**; Bortolussi, L.; Deshmukh, J.; Lindemann, L.; Paoletti, N.; *Conformal Predictive Monitoring for Multi-Modal Scenarios*. Accepted at International Conference on Runtime Verification, 2025.

- Bortolussi, L.; **Cairoli, F.**; Klein, J.; Petrov, T.; *Neuro-Symbolic Discovery of Markov Population Processes*; International Conference on Neuro-symbolic Systems (NeuS), Proceedings of Machine Learning Research, PMLR, 2025. https://proceedings.mlr.press/v288/bortolussi25a.html

- Giacomarra, F.; Hosseini, M.; Paoletti, N.; **Cairoli, F.**; *Certified Guidance for Planning with Deep Generative Models*; Proceedings of the 24th International Conference on Autonomous Agents and Multiagent Systems, p. 877-885, 2025. https://dl.acm.org/doi/10.5555/3709347.3743606

- Randone, F.; Doz, R.; **Cairoli, F.**; Bortolussi, L.; *Towards a probabilistic programming approach to analyse collective adaptive systems*; International Symposium on Leveraging Applications of Formal Methods; Cham: Springer Nature Switzerland, 2024. https://doi.org/10.1007/978-3-031-73709-1_11

- **Cairoli, F.**; Bortolussi, L.; Paoletti, N.; *Learning-Based Approaches to Predictive Monitoring with Conformal Statistical Guarantees*. International Conference on Runtime Verification; Cham: Springer Nature Switzerland, 2023. https://doi.org/10.1007/978-3-031-44267-4_26

- Bortolussi, L.; **Cairoli, F.**; Carbone, G.; Pulcini, P.; *Scalable Stochastic Parametric Verification with Stochastic Variational Smoothed Model Checking*. International Conference on Runtime Verification; Cham: Springer Nature Switzerland, 2023. https://doi.org/10.1007/978-3-031-44267-4_3

- Bortolussi, L.; **Cairoli, F.**; Giacomarra, F.; Scassola, D.; *Model Abstraction and Conditional Sampling with Score-Based Diffusion Models*. International Conference on Quantitative Evaluation of Systems; Cham: Springer Nature Switzerland, 2023. https://doi.org/10.1007/978-3-031-43835-6_21

- Bortolussi, L.; **Cairoli, F.**; Klein, J.; Petrov, T.; *Data-Driven Inference of Chemical Reaction Networks via Graph-Based Variational Autoencoders*. International Conference on Quantitative Evaluation of Systems; Cham: Springer Nature Switzerland, 2023. https://doi.org10.1007/978-3-031-43835-6_10

- **Cairoli, F.**; Paoletti, N.: Bortolussi; L.; *Conformal Quantitative Predictive Monitoring of STL Requirements for Stochastic Processes*. 26th ACM International Conference on Hybrid Systems: Computation and Control, 2023. https://doi.org/10.1145/3575870.3587113

- Ballarin, E.; Bortolussi, L.; **Cairoli, F.**; Gallese, C.; Nenzi, L.; Saveri, G. R*eliable and Explainable AI in Trieste*. In Ital-IA, pp. 394-396, 2023. https://ceur-ws.org/Vol-3486/26.pdf

- **Cairoli, F.**; Paoletti, N.; Bortolussi, L.; *Neural predictive monitoring for collective adaptive systems*; International Symposium on Leveraging Applications of Formal Methods, p. 30-46; Cham: Springer Nature Switzerland, 2022. https://doi.org/10.1007/978-3-031-19759-8_3

- **Cairoli, F.**; Bortolussi, L.; Paoletti, N.; *Neural predictive monitoring under partial observability*; International Conference on Runtime Verification, 121-141; Cham: Springer International Publishing, 2021. https://doi.org/10.1007/978-3-030-88494-9_7

- **Cairoli, F.**; Carbone, G.; Bortolussi, L.; *Abstraction of Markov Population Dynamics via Generative Adversarial Nets*; International Conference on Computational Methods in Systems Biology, 19-35; Cham: Springer International Publishing, 2021. https://doi.org/10.1007/978-3-030-85633-5_2

- Bortolussi, L.; **Cairoli, F.**; Carbone, G.; Franchina, F.; Regolin, E.; *Adversarial Learning of Robust and Safe Controllers for Cyber-Physical Systems*; IFAC-PapersOnLine 54 5, 223-228, Elsevier, 2021. https://doi.org/10.1016/j.ifacol.2021.08.502

- Bortolussi, L.; **Cairoli, F.**; Paoletti, N.; Smolka, S. A.; Stoller, S. D. *Bayesian Neural Predictive Monitoring*. In 2nd Workshop on Artificial Intelligence and Formal Verification, Logics, Automata and Synthesis, pp. 95-100, 2020. https://ceur-ws.org/Vol-2785/paper16.pdf

- Bortolussi, L.; **Cairoli, F.**; *Bayesian abstraction of Markov population models*; International Conference on Quantitative Evaluation of Systems, 259-276;

Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-30281-8_15

- **Cairoli, F.**; Fenu, G.; Pellegrino, F. A.; *Clinical Decision Support Using Colored Petri Nets: a Case Study on Cancer Infusion Therapy*; 6th International Conference on Control, Decision and Information Technologies, 314-319, IEEE, 2019 https://doi.org/10.1109/CoDIT.2019.8820456
- **Cairoli, F.**; Fenu, G.; Pellegrino, F. A.; Salvato, E.; *Model predictive control of glucose concentration based on signal temporal logic specifications*; 6th International Conference on Control, Decision and Information Technologies, 714-719, IEEE, 2019. https://doi.org/10.1109/CoDIT.2019.8820492
- Bortolussi, L.; **Cairoli, F.**; Paoletti, N.; Smolka, S. A.; Stoller, S. D.; *Neural predictive monitoring*; International Conference on Runtime Verification, 129-147; Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-32079-9_8
- Bortolussi, L.; **Cairoli, F.**; Paoletti, N.; Stoller, S. D.; *Conformal predictions for hybrid system state classification*. From Reactive Systems to Cyber-Physical Systems, 225-241; Cham: Springer International Publishing, 2019. https://doi.org/10.1007/978-3-030-31514-6_13

Teaching

- **Lecturer** - Course of "**Explainable and Neuro-Symbolic Artificial Intelligence**" (999MG), Module of Neuro-Symbolic Artificial Intelligence – 3 CFU. Master Degrees in Data Science and Artificial Intelligence, scheduled for **2025/26**.
- **Lecturer** - Course of "**Symbolic and Neuro-Symbolic Artificial Intelligence**" (337SM), Module of Neuro-Symbolic Artificial Intelligence – 3 CFU. Master Degrees in Data Science and Artificial Intelligence and in Scientific and Data Intensive Computing, **2024/25**.
- **Lecturer** - Course of "**Simulation Intelligence and Learning for Autonomous Systems**" (314SM-329SM), Module of Simulation Intelligence – 3 CFU. Master Degrees in Data Science and Artificial Intelligence and in Scientific and Data Intensive Computing, **2023/24**, **2024/25** and scheduled for **2025/26**.
- **Lecturer** - Preparatory Course of "**Computer Programming**" (483SM), Master Degrees in Data Science and Artificial Intelligence and in Scientific and Data Intensive Computing, **2023/24**, **2024/25** and scheduled for **2025/26**.
- **Teaching Assistant** - Course of "**Stochastic Modeling and Simulation**", Master Degree in Data Science and Scientific Computing, **2018/19**, **2019/20**, **2020/21** and **2021/22**.

Grants

- Awarded a €45,000 grant (March 2024 - October 2025) in the iNEST Young Researchers funding program for the research project "Reactive Scenario Generation for

Testing Resilience of Autonomous Systems (**RESGEN**)" – CUP J43C22000320006. This project aims to enhance the resilience of autonomous systems through innovative scenario-generation techniques, contributing significantly to the field of autonomous system safety and reliability.

Role: Principal Investigator

Research Projects

- **iNEST**: "Interconnected Nord-Est Innovation Ecosystem" funded by the European Union Next-GenerationEU (Piano Nazionale di Ripresa e Resilienza (PNRR) – Missione 4 Componente 2, Investimento 1.5 – D.D. 1058 23/06/2022, ECS_00000043) – Spoke 9: Models, Methods, Computing Technologies for Digital Twin. Collaboration of University of Padova, University of Trieste, National Institute of Oceanography and Applied Geophysics (OGS) and SISSA.

  Position: RTD-A

  Role: Research Topic Co-Coordinator, Member of University of Trieste Research Unit

- **SEDUCE**: "Designing Spatially Distributed Cyber-Physical Systems under Uncertainty" – PRIN 2017 n. 2017WRCCNB - CUP J95J19000200001. Collaboration of IMT Lucca, GSSI L'Aquila, University of Trieste, University of Camerino/University of Firenze.

  Position: PhD Student, Postdoctoral Fellow

  Role: Member of University of Trieste Research Unit

- **MDCLS**: "Multi Device Closed Loop System" funded by POR FESR 2014-2020. Collaboration of Generation Byte Srl, Glance Vision Tech Srl and the University of Trieste.

  Position: Research Fellow

  Role: Member of University of Trieste Research Unit

Research Group Direction

- **RESGEN Project Coordinator** — Supervision of the research group over the RESGEN project, comprising a postdoctoral fellow (Francesca Randone) enrolled under the RESGEN project and two PhD students (Francesco Giacomarra and Lorenzo Bonin) who conducted project-related research visits at the University of Southern California.

- **Research Topic Co-Coordinator** — Co-Coordination of Research Topic 3 (Automatic Learning for Digital Twins) inside Spoke 9 (Models, Methods, Computing Technologies for Digital Twins) of the iNEST project. University of Padova, SISSA and University of Trieste (Departments of Mathematics, Informatics and Engineering) collaborate at RT 3.

Academic Supervision

- **Supervision of Postdoctoral Fellow**: 1-year postdoctoral position of Francesca Randone under the RESGEN project.

  Topic: Probabilistic programs as stochastic surrogates.

- **Supervision of PhD Students**
  1. **Advisor** - PhD student at ADSAI PhD Program, University of Trieste: Nicholas Pearson.

     Topic: Time series analysis applied to the urban water cycle.
  2. **Co-Advisor** - PhD student at ADSAI PhD Program, University of Trieste: Francesco Giacomarra.

     Topic: Certification of Deep Generative Models.
  3. **Co-advisor** - PhD student at Konstanz University, Germany: Julia Klein.

     Topic: Data-Driven Inference of Chemical Reaction Networks.

Student Supervision

1. **Advisor** - MSc Thesis of Alessandro Della Siega, Master degree in Data Science and Artificial Intelligence: "Identification of stochastic processes" (ongoing).
2. **Advisor** - Internship and MSc Thesis of Annalisa Paladino, Master degree in Data Science and Artificial Intelligence: "Gradient-based optimisation of spatio-temporal logical objectives" (ongoing).
3. **Advisor** - BSc Thesis of Mattia Simonutti, Bachelor degree in Artificial Intelligence and Data Analytics: "Conformal Inference as a Regularisation Term in Regression Models" (Sept. 2024).
4. **Co-advisor** - Master thesis of Matteo Munini. Master Degree in Data Science and Artificial Intelligence, 2025 (ongoing).
5. **Co-advisor** - Master thesis of Davide Bartole: "Model abstraction using Temporal Difference Variational Auto Encoders". Master Degree in Statistics (March 2022).
6. **Co-advisor** - Internship of Paolo Pulcini and Matilde Castelli (Feb. 2022).
7. **Co-advisor** - Master thesis of Gaia Saveri: "Graph Neural Networks for Propositional Model Counting". Master Degree in Data Science and Scientific Computing (Sept. 2021).
8. **Co-advisor** - Bachelor thesis of Matteo Boi: "Adversarial Learning on Model of Artificial Pancreas". Bachelor Degree in Physics (March 2021).
9. **Co-advisor** - Master thesis of Francesco Franchina: "Adversarial Learning of Robust and Safe Controllers for Cyber-Physical Systems". Master Degree in Data Science and Scientific Computing (May 2020).
10. **Co-advisor** - Master thesis of Laura Falciani: "Bayesian Abstraction for Chemical Reaction Networks". Master Degree in Mathematics (March 2019).

Invited Talks at Conferences and Workshops

- **DTW 2025 - International Workshop on Digital Twins: Mathematical Analysis, Formal Methods and Scientific Machine Learning**, Padova (Italy)

  Invited Talk: "Automatic Learning for Digital Twins"

- **Keynote Speaker at Scientific Machine Learning: emerging topics**, SISSA, Trieste (Italy), 2025

  Invited Talk: "Towards Reliable and Interpretable Probabilistic Surrogate Models"

- **AISOLA 2024 – Bridging the Gap Between AI and Reality**, Crete, (Greece)

  Invited Talk: "Conformal Quantitative Predictive Monitoring and Conditional Validity"

Contributed Talks at Conferences and Workshops

- **DTW 2025 - International Workshop on Digital Twins: Mathematical Analysis, Formal Methods and Scientific Machine Learning**, Padova (Italy)

  Contributed Talk: "Probabilistic Program for Collective Adaptive Systems"

- **RV 2023 - International Conference on Runtime Verification**, Thessaloniki (Greece)

  Contributed Talk: "Learning-Based Approaches to Predictive Monitoring with Conformal Statistical Guarantees"

  Contributed Talk: "Scalable Stochastic Parametric Verification with Stochastic Variational Smoothed Model Checking"

- **HSCC 2023 (CPS-IoT Week)**, San Antonio (Texas, USA)

  Contributed Talk: "Conformal Quantitative Predictive Monitoring of STL Requirements for Stochastic Processes"

- **ISoLA 2022 - International Symposium On Leveraging Applications of Formal Methods, Verification and Validation**, Rhodes (Greece)

  Contributed Talk: "Neural Predictive Monitoring for Collective Adaptive Systems".

- **RV 2021 - International Conference on Runtime Verification**, online

  Contributed Talk: "Neural Predictive Monitoring under Partial Observability"

- **CMSB 2021 - International Conference on Computational Methods in System Biology**, online

  Contributed Talk: "Abstraction of Markov Population Dynamics via Generative Adversarial Nets"

- **LiVE 2020 - Workshop on Learning in Verification**, online

  Contributed Talk: "Neural Predictive Monitoring and a Comparison of Frequentist and Bayesian Approaches"

- **OVERLAY 2020 - Workshop on Artificial Intelligence and fOrmal VERification, Logic, Automata, and sYnthesis**, online

  Contributed Talk: "Bayesian Neural Predictive Monitoring"

- **HSB 2020 - Workshop on Hybrid Systems Biology**, online

  Contributed Talk: "Neural Predictive Monitoring"
  Contributed Talk: "Abstraction of Markov population models via Generative Adversarial Nets"

- **QEST 2019 - International Conference on Quantitative Evaluation of Systems**, Glasgow (Scotland, UK)

  Contributed Talk: "Bayesian Abstraction of Markov population models"

- **CoDIT 2019 - International Conference on Control, Decision and Information Technologies**, Paris (France)

  Contributed Talk: "Clinical Decision Support Using Colored Petri Nets: a Case Study on Cancer Infusion Therapy".

Invited Seminars

- Department of Computer Science, University of Southern California, 2023

  Invited Talk: "Conformal Quantitative Predictive Monitoring"

- Centre for the Advanced Study of Collective Behaviour, Konstanz University, 2022

  Invited Talk: "Abstractions of Markov Population Models"

- Department of Computer Science, Royal Holloway University, 2020

  Invited Talk: "Neural Predictive Monitoring"

- DSSC Seminar, University of Trieste

  Invited Talk: "Abstraction of Markov Population Dynamics via Generative Adversarial Nets", 2021
  Invited Talk: "Variational Auto-Encoders", 2020
  Invited Talk: "Conformal Predictions", 2020 and 2022

- Analysis Junior Seminar, SISSA Trieste 2020

  Invited Talk: "Abstraction of Markov Population Dynamics via Generative Adversarial Nets"

Attended Conferences, Workshops and Schools

Conferences:

- AISOLA 2024 – Bridging the Gap Between AI and Reality, Crete, Greece (2024)
- Scientific Machine Learning: Emerging Topics 2024, Trieste, Italy (2024)

- RV 2023 - International Conference on Runtime Verification, Thessaloniki, Greece (2023)
- HSCC23 (CPS-IoT Week), San Antonio, Texas, USA (2023)
- ISoLA 2022 - International Symposium On Leveraging Applications of Formal Methods, Verification and Validation, Rhodes, Greece (2022)
- CMSB 2019 - International Conference on Computational Methods in System Biology, Trieste (*Co-organizer*)
- QEST 2019 - International Conference on Quantitative Evaluation of Systems, Glasgow (Scotland, UK)
- CoDIT 2019 - International Conference on Control, Decision and Information Technologies, Paris (France)

Workshops:

- DTW 2025 - International Workshop on Digital Twins: Mathematical Analysis, Formal Methods and Scientific Machine Learning, Padova (Italy), 2025
- LiVE 2020 - Workshop on Learning in Verification, online
- OVERLAY 2020 - Workshop on Artificial Intelligence and fOrmal VERification, Logic, Automata, and sYnthesis, online
- HSB 2020 - Workshop on Hybrid Systems Biology, online
- "AI for Security and Security for AI", King Cross College, London (2020)

Schools:

- School: "Science Communication", Montagnana (2022)
- School: "Deep Learning", Gran Canaria (2022)
- Bootcamp: "Theory of Reinforcement Learning", online (2020)
- School: "Quantitative System Biology: Learning and Artificial Intelligence", International Centre for Theoretical Physics, Trieste (2019)

Courses:

- PhD Courses: Advanced Programming; Foundations of High Performance Computing; Cyber-Physical Systems; Data Visualization; Population-Based Optimization Methods; Variational Inference
- 24 CFU for Teaching: Pedagogia, Pedagogia speciale e didattica dell'inclusione; Psicologia; Antropologia; Metodologie e tecniche didattiche generali (Didattica delle scienze).

Session Chair

- **Switched and Stochastic Systems** session at **HSCC 2023** conference in San Antonio, Texas (USA).

Program Commitee Member

- European Conference on Artificial Intelligence (ECAI): 2024, 2025
- Runtime Verification (RV): 2024, 2025
- International Conference on Quantitative Evaluation of SysTems and International Conference on Formal Modeling and Analysis of Timed Systems (QEST+FORMATS): 2024
- Workshop on Verification and Monitoring at Runtime Execution (VORTEX): 2024
- International Conference on Formal Modeling and Analysis of Timed Systems Artifact Evaluation (FORMATS AE): 2023

Reviewer

- **Conferences**:
  - Learning for Decision and Control (L4DC) 2024
  - International Symposium on Leveraging Applications of Formal Methods (A)ISOLA 2024
  - Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2024
  - Runtime Verification (RV) 2023
  - Quantitative Evaluation of SysTems (QEST) 2020, 2021, 2022, 2023
  - Artificial Intelligence (AAAI) 2021, 2022, 2023
  - Computational Methods in System Biology (CMSB) 2019, 2021
  - Analysis and Design of Hybrid Systems (ADHS) 2021
  - Automated Technology for Verification and Analysis (ATVA) 2020
  - Conference on Decision and Control (CDC) 2019
- **Journals**:
  - Transactions on Services Computing (TSC)
  - IEEE Transactions on Computational Biology and Bioinformatics (TCBB)
  - Nonlinear Analysis: Hybrid Systems (NAHS)
  - ACM Transactions on Modeling and Computer Simulation (TOMACS)
  - NeuroComputing
  - Information and Computation
  - Leibniz Transactions on Embedded Systems

Outreach Activities

- Course on **Digital Twin for Sustainable Economy**, Camera di Commercio Venezia Giulia, Trieste, 2024

  Lecture on "*Data-driven modeling for Digital Twin: Simulation and AI*".

- **PCTO Activities** for Galileo Galilei Scientific High School, Trieste, 2022/23

  Designed and led the PCTO (Percorsi per le Competenze Trasversali e per l'Orientamento) program "*Statistics and Artificial Intelligence with Python*".

- Organisation of **Data Science Seminars** at Department of Informatics, University of Trieste, 2019-2023

- **Volunteer at Trieste Next**, Festival della Ricerca Scientifica, 2019

  AI dissemination activities organised by the Informatics Department of the University of Trieste.

- **Volunteer at Trieste Next**, Festival della Ricerca Scientifica, 2018

  Coding with Scratch in collaboration with Coderdojo FVG.

- **La Matematica Dei Ragazzi**, Progetto CIRD (Centro Interdipartimentale di Ricerca Didattica dell'Università di Trieste), 2016/17

  Course on *Statistics and Cryptography* for middle school students. Title "AIFARGOTTIRC... E ACITAMETAM OVVERO L'ARTE DEI CODICI SEGRETI" in collaboration with teachers Valentina Bologna and Paola Castellan.

- **Matematici al Lavoro**, Trieste, 2018

  Invited talk for mathematics students. Title "*The Mathematical Mind: A Secret Weapon in Computer Science*".

- **Volunteer for MaTeinItaly**, Triennale Milano, 2014

  Exhibition "MaTeinItaly. Matematici alla scoperta del futuro".

Personal skills

Languages	Italian (native) English (proficiency)
Programming Languages	Python (PyTorch, Tensorflow), MATLAB, R, C, C++, Java
Software	Excel, LaTeX

Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali", e del GDPR (Regolamento UE 2016/679) relativo alla protezione delle persone fisiche riguardo al trattamento dei dati personali.

Trieste, 02/09/2025