

RICCARDO CADEI

Researcher - Machine Learning and Causality

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Riccardo Cadei



Education

ISTA

Jan 2024 - Present

Scaling scientific experiment causal analyses in Biology, Neuroscience, and Medicine, with modern Machine Learning [6, 7, 9, 5, 8] + [12, 13, 14, 16, 15].
Supervisor: Francesco Locatello (supported by a Google Research Scholar Award)

Ph.D. Causal Learning and AI

Vienna, Austria

INRIA (Paris)

Modern Computer Vision for scientific experiments understanding.
Supervisor: Cordelia Schmid **Group:** Willow **Program:** ELLIS (ELSA)

EPFL

Sep 2020 – Feb 2023

Relevant courses: ML, ANN, DL, Applied Data Analysis, Visual Intelligence.
Grade: 5.53/6 **Teaching Assistant:** Introduction to Machine Learning

M.Sc. Data Science

Lausanne, Switzerland

Harvard University (Cambridge, MA)

Thesis: Interpretable Het. Treatment Effect discovery and inference [3, 4] + [a,b].
Grade: 6/6 **Grant:** Causal Inference for Machine Learning

Visiting

Politecnico di Milano

Sep 2017 – Jul 2020

Thesis: Mathematical Programming for activity planning in Oncology Day-Hospital.
Grade: 110/110 **Associations:** PoliMi Data Scientists, Ass. Ing. Matematici

B.Sc. Mathematical Engineering

Milan, Italy

Other Research Appointments

Harvard University

Sep 2022 – Sep 2023

Cambridge (MA), United States

Research Assistant @NSAPH: Causal Machine Learning for climate change, environmental impacts on health outcomes, and regulatory policy [3, 4] and [11].

Schlumberger-Doll Research

Feb 2022 – Aug 2022

Cambridge (MA), United States

Machine Learning Researcher: Deep Learning for Causal Modeling and interpretation of acoustic subsurface data for anomaly detection and prevention.

École polytechnique fédérale de Lausanne

Nov 2020 – Feb 2022

Lausanne, Switzerland

Research Assistant (Summer Intern) @iGH: Developing a mobile app for (non-invasive) upper body posture detection using Deep Learning.

Research Assistant @VITA: Introducing a Causal formalism and a Robust and Adaptive modular architecture for Motion Forecasting [2] and [10].

Research Assistant @LESO-PB: Introducing a U-Net based model for detecting available rooftop areas to install photovoltaic panels from satellite images [1].

Consulting and Entrepreneurship

Entrepreneur First

Oct 2023 – Dec 2023

Paris, France

Founder in Residence: Learning entrepreneurial skills while trying to launch a start-up in Responsible AI and Sustainability at StationF.

L.O.L. Consultants

Dec 2020 – Feb 2021

[remote] Melbourne, Australia

Machine Learning Engineer: Detection of available rooftop area to install photovoltaic panels from high-quality satellite images using Deep Learning.

Awards

Career

Nova 111 Student List

2023

Selected among the 10 most promising Italian Computer Scientists Under25.

Machine Learning

Jane Warren Award

2023

By Health Effects Institute for Causal Rule Ensemble algorithm [3].

Generali Data Challenge

2021

Best model and code in the Churn Classification Data-hon at @Generali S.p.a out of 280+ participants.

Higgs Boson Challenge

2020

2nd place in the AICrowd final challenge of Machine Learning course at @EPFL out of 290+ teams.

Oracle GraphML Contest

2019

1st place in the Kaggle final challenge of Graph Machine Learning course at @Politecnico di Milano in partnership with @Oracle Labs.

ML for Networking Contest

2019

1st place in the Kaggle final challenge of ML for Net-work course at @Politecnico di Milano.

Mathematics

International competition for mathematical and logical games

2018

5th national place (ITA), class L2 (Under21).

Grand Prix of Applied Mathematics

2017

5th national place (ITA) out of 7500+ students.

2016

6th national place (ITA) out of 7500+ students.

Coding

Machine Learning: Python, R, Julia

Deep Learning: PyTorch, Tensorflow, HuggingFace

Math: MATLAB, Python, R, AMPL

Big Data: Spark, Scala, SQL, HDFS, AWS

Robotics: RobotC, C, Python

App and Web: HTML, CSS, Android Studio

Languages

Italian: C2, English: C1, French: A1

Referees

Dr. Francesca Dominici

Harvard

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Dr. Cordelia Schmid

Google/INRIA

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Dr. Francesco Locatello

ISTA

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Publications

Google Scholar statistics

Total citations: 223

h-index: 6

Full Articles (arxiv, main conferences, journals)

- [1] Roberto Castello, Alina Walch, Raphael Attias, **RC**, Shasha Jiang, and Jean-Louis Scartezzini. Quantification of the suitable rooftop area for solar panel installation from overhead imagery using Convolutional Neural Networks. In *Journal of Physics: Conference Series*, volume 2042, page 012002. IOP Publishing, 2021.
- [2] Yuejiang Liu, **RC**, Jonas Schweizer, Sherwin Bahmani, and Alexandre Alahi. Towards Robust and Adaptive Motion Forecasting: A Causal Representation Perspective. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 17081–17092, 2022.
- [3] Falco J Bargagli-Stoffi*, **RC***, Kwonsang Lee, and Francesca Dominici. Causal rule ensemble: Interpretable Discovery and Inference of Heterogeneous Treatment Effects. *arXiv preprint arXiv:2009.09036*, 2023.
- [4] **RC***, Naeem Khoshnevis*, Kwonsang Lee, Daniela Maria Garcia, and Falco J. Bargagli-Stoffi. CRE: an R package for interpretable discovery and estimation of Heterogeneous Treatment Effect. *Journal of Open Source Software*, 2023.
- [5] **RC**, Lukas Lindorfer, Sylvia Cremer, Cordelia Schmid, and Francesco Locatello. Smoke and mirrors in causal downstream tasks. *Advances in Neural Information Processing Systems (NeurIPS)*, 2024.
- [6] Tommaso Mencattini*, **RC***, and Francesco Locatello. Exploratory causal inference in saence. *arXiv preprint arXiv:2510.14073*, 2025.
- [7] **RC**, Ilker Demirel, Piersilvio De Bartolomeis, Lukas Lindorfer, Sylvia Cremer, Cordelia Schmid, and Francesco Locatello. Causal lifting of neural representations: Zero-shot generalization for causal inferences. *Advances in Neural Information Processing Systems (NeurIPS)*, 2025.
- [8] Dingling Yao, Shimeng Huang, **RC**, Kun Zhang, and Francesco Locatello. The third pillar of causal analysis? a measurement perspective on causal representations. *Advances in Neural Information Processing Systems (NeurIPS)*, 2025.
- [9] Dingling Yao, Dario Rancati, **RC**, Marco Fumero, and Francesco Locatello. Unifying Causal Representation Learning with the Invariance Principle. *Proceedings in the Thirteenth International Conference on Learning Representations (ICLR)*, 2025.

Workshop Articles

- [10] Yuejiang Liu, **RC**, and Alexandre Alahi. Towards Robust and Adaptive Motion Forecasting: A Causal Representation Perspective. In *NeurIPS Workshop on Distribution Shifts: Connecting Methods and Applications*, 2021.
- [11] Mauricio Tec, **RC**, Francesca Dominici, and Corwin Zigler. Projecting the climate penalty on PM_{2.5} pollution with spatial deep learning. In *ICLR Workshop in Tackling Climate Change with Machine Learning*, 2023.
- [12] **RC**, Lukas Lindorfer, Sylvia Cremer, Cordelia Schmid, and Francesco Locatello. Smoke and mirrors in causal downstream tasks. *ICML Workshop in AI for Science: Scaling in AI for Scientific Discovery*, 2024.
- [13] Dingling Yao, Dario Rancati, **RC**, Marco Fumero, and Francesco Locatello. Unifying Causal Representation Learning with the Invariance Principle. *NeurIPS Workshop on (i) Causal Representation Learning and (ii) UniReps*, 2024.
- [14] **RC**, Ilker Demirel, Piersilvio De Bartolomeis, Lukas Lindorfer, Sylvia Cremer, Cordelia Schmid, and Francesco Locatello. Causal lifting of neural representations: Zero-shot generalization for causal inferences. *ICLR Workshop on (i) Spurious Correlation and Shortcut Learning and (ii) XAI4Science*, 2025.
- [15] **RC*** and Christian Internò*. The narcissus hypothesis: Descending to the rung of illusion. *NeurIPS Workshop on Evaluating the Evolving LLM Lifecycle*, 2025.
- [16] Dingling Yao, Shimeng Huang, **RC**, Kun Zhang, and Francesco Locatello. The third pillar of causal analysis? a measurement perspective on causal representations. *ICML Workshop on Scaling Up Intervention Models*, 2025.

* Co-first authors.

Software Packages

- [a] Naeem Khoshnevis, **RC**, Daniela Maria Garcia, Kwonsang Lee, Falco Joannes Bargagli Stoffi, "CRE: R Package Causal Rule Ensemble Algorithm", CRAN, 2023 (10 000+ downloads,  Website,  GitHub).
- [b] **RC**, Naeem Khoshnevis, Falco Joannes Bargagli Stoffi "pycre: Python Package Causal Rule Ensemble Algorithm", pypy, 2023 ( GitHub).

Events

Selected Talks

Causality in the era of AI @Huawei x IHES

Causality in the era of Foundational Models @Bellairs

Causality for Science Worskhop (Invited Keynote) @NeurIPS'25

Reviewer

NeurIPS, AAAI

Other Workshops and minor journals

Main Conferences

NeurIPS: 2021 (online), New Orleans 2022, Vancouver 2024, San Diego 2025

ICML: Vienna 2024

ICLR: 2023 (online), Vienna 2024

CVPR: New Orleans 2022

Summer Schools

M²L Summer School: Milan 2020-22 (online)

Neurosymbolic Programming: Los Angeles 2022

Causality: Barbados 2025, Cambridge (UK) 2026

MLSS: Senegal 2025

Other Interests

Sport: Marathon Runner (2:42:35) @VRC, Long distance Hiker, Cycle Tourist, Skier and Skater.

Volunteer: NeurIPS and ICLR (logistic), LeadTheFuture (mentoring), Africatletics (teaching and coaching), BrixiaMataTe (teaching), CARITAS (childcare), Operazione Mato Grosso (various), AVIS (blood donor).