Sara Magliacane

Causality, transfer learning, active learning

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Work experience

Nov. 2022 - current **Assistant Professor at AMLab, University of Amsterdam**.

Nov. 2020 - Nov. 2022 **Assistant Professor at INDELab, University of Amsterdam**.

- Causality-inspired machine learning, especially applications of causality to transfer learning and domain adaptation
- Continuing collaboration with MIT-IBM
- Teaching (Spring 2022): Causal Data Science at the Masters in Data Science

Apr. 2019 - current **Research Scientist at MIT-IBM Watson AI Lab, Cambridge**.

- PI on exploratory MIT-IBM project with Douglas Lauffenburger (MIT) on cross-species translation and applications of causal domain adaptation to system biology
- Co-PI on exploratory (and extended to core) MIT-IBM project with Armando Solar-Lezema (MIT) and Nathan Fulton (MIT-IBM) on safe AI approaches and program synthesis
- Continuing work on core MIT-IBM project on causality

Nov. 2017 - Apr. 2019 **Postdoctoral researcher at AI Foundations group in IBM Research NY**.

- Part of core MIT-IBM project on learning causal graphs from data, experiment/intervention design, causal transfer learning with Caroline Uhler (MIT) and Guy Bresler (MIT)
- Part of core MIT-IBM project on neuro-symbolic approaches, learning logic rules from data with Josh Tenenbaum (MIT)

Mar. 2016 - Nov. 2017 **Researcher at Causality Group in Universiteit van Amsterdam** .

Causal transfer learning and causal learning from data in different experimental settings.

May 2014 - Aug. 2014 **Research Intern at Google Research NYC (hosts: Cong Yu, Flip Korn)**.

Extracting information from semi-structured data in the WebTables team.

June 2013 - Sept. 2013 **Software Engineering Intern at Google Zurich (host: Selen Basol)**.

Machine learning on location data in the Your Timeline team, Google Maps.

Education

Oct. 2011 - June 2017 **PhD in Computer Science at VU Amsterdam**.

Title: Logics for causal inference under uncertainty `https://research.vu.nl/en/publications/logics-for-causal-inference-under-uncertainty`
Advisors: Joris Mooij (UvA), Paul Groth (Elsevier Labs/VU), Frank van Harmelen (VU)

- Research on the use of probabilistic logics for discovering causal relations from noisy data, potentially with latent confounders and different experimental settings.
- Research on scaling probabilistic logic inference, focusing on a probabilistic fuzzy logic (PSL) based on continuous Markov Random Fields.
- Research on distributed implementation of ADMM for MAP inference in continuous MRF focused on logic applications.
- Research on query optimization techniques for graph databases/ Semantic Web.

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Oct. 2008 – Mar. 2011 **MEng in Computer Engineering (110/110 cum laude) at Politecnico di Milano and Politecnico di Torino (double degree)**.

Selected Publications

NeurIPS 2022 F. Feng, B. Huang, K. Zhang, S. Magliacane, *Factored Adapation for Non-Stationary Reinforcement learning*, NeurIPS 2022

ICML 2022 P. Lippe, S. Magliacane et al. *CITRIS: Causal Identifiability from Temporal Intervened Sequences*, ICML 2022

ICLR 2022 B. Huang, F. Feng, S. Magliacane, K. Zhang, *AdaRL: What, Where, and How to Adapt in Transfer Reinforcement Learning*, ICLR 2022

NeurIPS 2020 C. Squires, S. Magliacane et al., *Active Structure Learning of Causal DAGs via Directed Clique Trees*, NeurIPS 2020

HSCC 2021 N. Fulton, N. Hunt, S. Magliacane et al., *Verifiably Safe Exploration for End-to-End Reinforcement Learning*, **Best paper at HSCC 2021**, `https://arxiv.org/abs/2007.01223`

JMLR 2020 J. M. Mooij, S. Magliacane, T. Claassen, *Joint Causal Inference from Multiple Contexts*, JMLR 2020, `https://arxiv.org/abs/1611.10351`

NeurIPS 2019 K. Greenewald, D. Katz, K. Shanmugam, S. Magliacane, M. Kocaoglu, E. B. Adsera, G. Bresler, *Sample-efficient Active Learning of Causal Trees*, NeurIPS 2019

UAI 2018 T. Blom, A. Klimovskaia, S. Magliacane, J. M. Mooij, *An Upper Bound for Random Measurement Error in Causal Discovery*, Uncertainty in Artificial Intelligence 2018

NeurIPS 2018 S. Magliacane, T. van Ommen, T. Claassen, S. Bongers, P. Versteeg, J. M. Mooij, *Domain Adaptation by Using Causal Inference to Predict Invariant Conditional Distributions*, NeurIPS 2018, `https://arxiv.org/abs/1707.06422`, **also presented as a spotlight in the Causal learning workshop**

Scholarships and Awards

2021 ACM HSCC Best paper award

2015 First prize at CRM Causal Inference Challenge

2011 IBM Best Student Recognition EMEA 2011 (seven top Italian students in CS)

2008-2010 Alta Scuola Politecnica (90 top students at Politecnico di Milano in all disciplines)

Academic service, event organization and invited talks

Keynote Speaker Causal Data Science meeting 2021, `https://causalscience.org`

Invited Speaker Online Causal Inference Seminar, `https://sites.google.com/view/ocis/`

Invited Speaker ICLR 2020 workshop on Causal learning for decision making

Invited Speaker International Workshop on Causal Modeling and Machine Learning 2019

Organizer Causal Learning and Reasoning (CLeaR) 2022, 2023 `https://www.cclear.cc/2022`

Organizer UAI 2022 Causal Representation Learning Workshop, `https://crl-uai-2022.github.io/`

Organizer UAI 2021 Causal Inference Workshop, `https://sites.google.com/uw.edu/causaluai2021/home`

Organizer NeurIPS 2020 workshop on Causal Discovery and Causality-Inspired ML, `https://www.cmu.edu/dietrich/causality/neurips20ws/`

Organizer Bridging causal inference, RL and transfer learning workshop (CRT2019)

Reviewer Machine learning reviewer since 2016 (NeurIPS, ICML, ICLR, AISTATS, UAI, JMLR, AAAI, IJCAI)

Area-chair, Mentor Women in Machine Learning 2017-2021, AISTATS 2021

Mentor HackMIT 2019, 2020