

Sagar Malhotra

Fondazione Bruno Kessler
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url: countinglogic.github.io

Born: May 6, 1994
Nationality: Indian

Current position

11.2019-Present PhD Candidate
Advisor: Prof. Luciano Serafini
Thesis: Analytical Approaches for Efficient and Consistent inference in Relational Domains¹
University of Trento, Italy
Fondazione Bruno Kessler, Italy

Research Experience and Education

2018-2019 Junior Research Fellow
Advisors: Luciano Serafini, Radim Nedbal
Project: Variational Inference in Hybrid Domains
Data and Knowledge Management Unit
Fondazione Bruno Kessler, Italy

2018-2015 MSc in Physics
Advisors: Roberto Iuppa (Unitn), Marco Cristoforetti (FBK)
Thesis: Deep Learning For Track Reconstruction in Next Generation HEP Experiments
Fondazione Bruno Kessler, Italy
University of Trento, Italy

2015-2012 BSc in Physics with Honors
University of Delhi, India

Research Interests

My research revolves around formal analysis of probability distributions over relational structures. I am especially interested in:

- Random graph models and their extension to more complex relational domains
- Exact and approximate probabilistic inference

¹Tentative title

- Combinatorics over relational structures
- Consistency of probabilistic inference
- Estimating asymptotic properties from sub-sampled relational structures

Publications

- 2022 Alessandro Daniele, Tommaso Campari, **Sagar Malhotra** and Luciano Serafini.
Deep Symbolic Learning: Discovering Symbols and Rules from Perception
Under Review
- 2022 **Sagar Malhotra** and Luciano Serafini. On Projectivity in Markov Logic Networks
Proceedings of Machine Learning and Knowledge Discovery in Databases. Research Track - European Conference, ECML PKDD 2022.
[arXiv:2204.04009](#)
- 2022 **Sagar Malhotra** and Luciano Serafini. Weighted Model Counting in FO^2 with Cardinality Constraints and Counting Quantifiers: A Closed Form Formula
(Oral presentation) *Proceedings of the 36th AAAI Conference on Artificial Intelligence.*
[AAAI 2022](#)
- 2021 **Sagar Malhotra** and Luciano Serafini. A Combinatorial Approach to Weighted Model Counting in the Two Variable Fragment with Cardinality Constraints
Proceedings of the 20th International Conference of the Italian Association for Artificial Intelligence
[AlxIA 2021](#)

Workshop Publications

- 2022 **Sagar Malhotra** and Luciano Serafini. On Projectivity in Markov Logic Networks
9th International Workshop on Probabilistic Logic Programming, 2022
[PLP 2022:Preprint](#)
- 2021 **Sagar Malhotra** and Luciano Serafini. Weighted Model Counting in FO^2 with Cardinality Constraints and Counting Quantifiers: A Closed Form Formula
10th International Workshop on Statistical Relational AI, 2021
[StarAI 2021](#)

Talks and Tutorials

- 2022 On Probabilistic Inference in Logical Domains
Invited Speaker at the Institute of Informatics, Ludwig Maximilian University of Munich, Germany
- 2022 A Tutorial on Probabilistic Inference in Logical Domains, University of Padova, Italy
- 2022 Weighted First-Order Model Counting, DocInProgress, University of Trento, Italy
- 2022 Weighted First-Order Model Counting, AAAI 2022@FBK Workshop

Programming Skills

Fluent: Python, Pandas, \LaTeX

Familiar: Mathematica, R, Pytorch, HTML

Reviewing and PC Experience

PC Member at AAAI 2022, Reviewer at AISTATS 2022, Sub-Reviewer at KR 2021

Awards and Achievements

- 2017 Part of the winning team in Industrial Problem Solving using Physics ([IPSP 2017](#))
- 2017 Awarded fully funded trip to Innovation Days-Innsbruck in StartUp Lab, Trento
- 2016 Awarded full Scholarship for the Joint Masters in Theoretical Physics at University of Trento and SISSA- Trieste (Declined)
- 2016 Awarded Opera Universitaria Scholarship for Masters in Physics at University of Trento
- 2016 Amongst top 5% candidates in the Joint Entrance Screening Test- Physics 2016 among ~ 5000 candidates
- 2016 Amongst top 5 % candidates in IIT Joint Admission Test for Masters in Physics 2016 among ~ 10000 candidates

References

Luciano Serafini
Fondazione Bruno Kessler, Trento, Italy
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Dr. Felix Weitkämper
Institute of Informatics, LMU, Munich, Germany
Email: felix.weitkaemper@lmu.de

Dr. Mauro Dragoni
Fondazione Bruno Kessler, Trento, Italy
Email: dragoni@fbk.eu