# Sagar Malhotra

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url: countinglogic.github.io

Born: May 6, 1994
Nationality: Indian

## Current position

11.2019-01.2023 PhD Candidate
Advisor: Luciano Serafini
Project: Analytical Approaches to Lifted Inference[1]
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 current research interests revolve around knowledge representation and reasoning under uncertainity. I am especially interested in:

[1] Tentative title

· Exact and Approximate Probabilistic Inference
· Consistency of Probabilistic Inference
· Weighted Model Counting
· Structure Learning
· Exponential Random Graphs and their extension to logical domains
· Asymptotic Inference

## Publications

2022 Alessandro Daniele, Tommasso Campari, **Sagar Malhotra** and Luciano Serafini.
Deep Symbolic Networks: Discovering Symbols and Symbolic Knowledge 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 $\text{FO}^2$ with Cardinality Constraints and Counting Quantifiers: A Closed Form Formula
*(Oral presentation) Proceedings of the $36^{th}$ 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 $20^{th}$ International Conference of the Italian Association for Artificial Intelligence*
AIxIA 2021

## Workshop Publications

2022 **Sagar Malhotra** and Luciano Serafini. On Projectivity in Markov Logic Networks
*$9^{th}$ International Workshop on Probabilistic Logic Programming, 2022*
PLP 2022:Preprint

2021 **Sagar Malhotra** and Luciano Serafini. Weighted Model Counting in $\text{FO}^2$ with Cardinality Constraints and Counting Quantifiers: A Closed Form Formula
*$10^{th}$ 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 On Projectivity in Markov Logic Networks, DKM Group Seminar
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, 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 $\sim$ 5000 candidates
2016 Amongst top 5 % candidates in IIT Joint Admission Test for Masters in Physics 2016 among $\sim$ 10000 candidates

## References

Prof. 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