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Research Statement

I study automated learning and reasoning algorithms, working at the intersection of logic, probability and Machine Learning. I am especially interested in methods that are provably efficient, sound and explainable by construction. Recently, I am also interested in developing formal verification methods for black-box machine learning models.

Doctoral Research

My Ph.D. work focused on Statistical Relational Learning (SRL) models that describe a parametric probability distribution on a set of possible relational structures defined in a First Order Logic (FOL) Language. Inference and learning in these models reduces to Weighted Model Counting (WMC), a $\#P$ -complete problem in general. I developed novel combinatorial approaches for efficient WMC in multiple interesting fragments and extensions of FOL.