Probabilistic Inductive Logic Programming
Based on Answer Set Programming

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Abstract. Answer Set Programming (ASP) is a form of declarative pro-
gramming based on the concept of so-called stable models of programs,
with roots in logic programming and nonmonotonic reasoning. ASP has
emerged as a fully declarative programming paradigm which provides
significant advantages in areas such as search and optimization prob-
lem solving, common sense knowledge representation, and modeling of
nondeterminism. In my talk, I will describe how ASP can be used as a
basis for expressive probabilistic inductive logic programming, and the
features (and challenges) of this direction. After introducing ASP and
providing an overview of existing approaches to probabilistic declarative
programming based on stable model semantics, I will present a recent
framework for probabilistic inductive ASP which provides a high level
of expressiveness (including the option to use first-order formulas with
probabilities) in combination with a high degree of adaptability to a vari-
ety of tasks. I will discuss algorithms for inference and machine learning
in this framework and their respective performance characteristics, and
present possible applications of our framework. The last part of my talk
will outline directions for future research in this area.