Real-World Learning
with Markov Logic Networks

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Machine learning and data mining systems have achieved many impressive successes, but to become truly widespread they must be able to work with less help from people. This requires automating the data cleaning and integration process, handling multiple types of objects and relations at once, and easily incorporating domain knowledge. In this talk, I describe how we are pursuing these aims using Markov logic networks, a representation that combines first-order logic and probabilistic graphical models. Data from multiple sources is integrated by automatically learning mappings between the objects and terms in them. Rich relational structure is learned using a combination of ILP and statistical techniques. Knowledge is incorporated by viewing logic statements as soft constraints on the models to be learned. Application to a real-world university domain shows our approach to be accurate, efficient, and less labor-intensive than traditional ones.

This work, joint with Parag and Matthew Richardson, is described in further detail in Richardson and Domingos [1], Richardson and Domingos [2], and Parag and Domingos [3].

References

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