Relational Learning from Spatial Data: Retrospect and Prospect

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Summary

Learning from spatial data is characterized by two main features. First, spatial objects have a locational property which implicitly defines several spatial relationships (topological, directional, distancebased) between objects. Second, attributes of spatially related units tend to be statistically correlated. These two features argue against the assumption of the independent generation of data samples (i.i.d. assumption) underlying classic machine learning algorithms, and motivate the application of relational learning algorithms, whose inferences are based on both instance properties and relations between data. This relational learning approach to spatial domains has already been investigated in the last decade, and important accomplishments in this direction have already been performed. In this talk, we retrospectively survey major achievements on relational learning from spatial data and we report open problems which still challenges researchers and prospectively suggest important topics for incorporation into a research agenda.

Bibliography

Donato Malerba is a full professor at the Department of Informatics, University of Bari, where he teaches in the courses of "Algorithms and Data Structures", "Advanced Data Base Systems", and "Knowledge Bases and Data Mining". In 1992 he was assistant specialist at the Institute of Computer Science, University of California, Irvine. His research activity mainly concerns machine learning and data mining, in particular numeric-symbolic methods for inductive inference, classification and model trees, (multi-)relational data mining, spatial data mining, web mining, and their applications to intelligent document processing and digital map interpretation. He has published more than 150 papers in international journals and conference proceedings. He was in the Management Board of the European Coordinated Action FP6-021321 "KDUbiq - Knowledge Discovery in Ubiquitous Environments" (December 2005 - May 2008) and in the Management Board of the European project IST-2001-33086 "KDNet - European Knowledge Discovery Network of Excellence" (2002 - 2004). He participated to several European and National projects. He was responsible of the unit of Bari in the European project IST-1999-10536 SPIN (Spatial Mining on Data of Public Interest) and in two