PROBABILISTIC GRAPHICAL MODELS AND MACHINE LEARNING

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Abstract

Much of future computer science applications will involve machines that learn from sample data. Rather than be fully-encoded by people using experience and heuristics they will be statistically based machine learning algorithms. Classical methods of machine learning solve simple classification and regression problems using tools such as logistic regression, neural networks, support vector machines, etc. However the presence of a large number of variables makes such classical methods computationally infeasible. Probabilistic graphical models (PGMs) allow a principled approach to deal with this complexity. They also allow a natural explanation of how the methods arrive at their conclusions. This talk will explain the role of PGMs in several applications such as computer vision and computational linguistics and indicate some results of work in computational forensics.