

基于因果影响独立模型的贝叶斯网络参数学习

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Parameters learning of Bayesian networks based on independence of causal influence model

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摘要

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摘要

基于因果影响独立模型及其中形成的特定上下文独立关系, 提出一种适于样本学习的贝叶斯网络参数学习算法. 该算法在对局部概率模型降维分解的基础上, 通过单父节点条件下的子节点概率分布来合成局部结构的条件概率分布, 参数定义复杂度较低且能较好地处理稀疏结构样本集. 实验结果表明, 该算法与标准最大似然估计算法相比, 能充分利用样本信息, 具有较好的学习精度.

关键词: 贝叶斯网络, 因果影响独立, 样本集, 参数学习

Abstract:

Based on the independence of the causal influence model and the context-specific independent relations arising in the model, a parameters learning algorithm of Bayesian networks suiting for sample learning is proposed. Through decomposing and dimension-reducing the local probability model, the algorithm can synthesize the conditional probability distribution of the local structure with the probability distribution of the child nodes under the single parent node. The algorithm has low parameter-defining complexity and can better deal with the sparse structure sample set. Compared with the standard maximum likelihood estimation algorithm, the experimental results show that the proposed algorithm can fully extract the information from sample data and has higher learning accuracy.

Key words: Bayesian networks independence of causal influence sample set parameters learning

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