Ji, Junzhong; **Zhang, Hongxun**; **Hu, Renbing**; **Liu, Chunnian**

A Bayesian network learning algorithm based on independence test and ant colony optimization. (English) Zbl 1212.68129

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Summary: In order to solve the drawbacks of the ant colony optimization for learning Bayesian networks (ACO-B), this paper proposes an improved algorithm based on the conditional independence test and ant colony optimization (I-ACO-B). First, the I-ACO-B uses order-0 independence tests to effectively restrict the space of candidate solutions, so that many unnecessary searches of ants can be avoided. And then, by combining the global score increase of a solution and local mutual information between nodes, a new heuristic function with better heuristic ability is given to induct the process of stochastic searches. The experimental results on benchmark data sets show that the new algorithm is effective and efficient in large scale databases, and greatly enhances convergence speed compared to the original algorithm.

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