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誤差逆伝播ニューラルネットワークを用いた帰納論理プログラミングルールの近似

シンツピンヨー・スクリー†

† タイ国タマサート大学科学技術学部計算科学科
大阪大学産業科学研究所知能アーキテクチャー研究分野
E-mail: †sukree@ai.sanken.osaka-u.ac.jp

Approximate Match of ILP's Rules Using Backpropagation Neural Networks

Sukree SINTHUPINYO†

† Department of Computer Science, Faculty of Science and Technology, Thammasat University
Department of Architecture for Intelligence, ISIR, Osaka University
E-mail: †sukree@ai.sanken.osaka-u.ac.jp

Abstract When an ILP system is applied to a real-world domain, especially the multi-class or the noisy domain, the produced rules may not cover or may not exactly match with the unseen data. In this case, the ILP system alone cannot select a rule that best matches with the data. We thus propose a method that can help the ILP system to solve this problem. The basic idea of our method is that when there is no rule covering an example, we can make use of rules which partially match with the example. These partially matching rules capture the features of the example. The best matching rule should be the rule that matches many important features and does not necessarily match unimportant features. To extract these features from the ILP's rules, we propose an approach that generates the features based on the notions of *closed chains* and *open chains*. These features are then determined their significant level in term of weight trained by Backpropagation Neural Network. We evaluate our approach on five first-order datasets, i.e. Thai Optical Character Recognition, Finite Element Mesh Design, Mutagenesis, King-Rook-King Illegal and Classificaion of Connecting Points in Thai Printed Character. The results show improvements of our method over the use of the original rules.