形式概念分析对粗糙集理论的表示及扩展

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Abstract

This paper aims to establish the relationship between formal concept analysis and rough set theory. The following results are obtained: (1) a derivative formal context of an information system can be induced by the notion of nominal scale and the technique of plain scaling in formal concept analysis; (2) some core notions in rough set theory such as partition, upper and lower approximations, independence, dependence and reduct can be reinterpreted in derivative formal contexts. In addition, the limitation of rough set theory to data processing is analyzed. The results presented in this paper provide a basis for the synthesis of formal concept analysis and rough set theory.

摘要
侧重于建立形式概念分析与粗糙集之间融合的理论基础.利用形式概念分析中名义梯级背景(nominal scale)的概念,对信息系统进行平面梯级(plain scaling)得到了衍生的形式背景.证明了粗糙集理论中的划分、上下近似、独立、依赖、约简等核心概念都可以在相应的衍生背景中进行

表示.揭示了粗糙集理论在分析处理数据时的局限性,指出了利用梯级的方法可以扩展粗糙集理论.

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