

Rough Concept Lattices and Domains ^{*}

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Abstract

Rough Set Theory (RST) and Domain Theory (DT) are two independent but important areas of computer science. In this paper, they have a meeting point from the angle of knowledge representation and reasoning (KRR). First, we give the simplified relationship between two existing rough concept lattices and complete lattices via Galois connections (\square, \diamond). Second, we show that for a formal context, if the set of attributes is finite, the notion of object-oriented concepts corresponds precisely to that of states in the induced (Scott's) information system. Generally, we introduce the notion of *rough approximable concept* and show that the rough approximable concepts are exactly the states of the induced information system for every formal context. At last, we show a new representation of algebraic lattices which are identical to Scott domains with a top element. These results strengthen the expressive power of rough concept lattices and further establish the deep relationship between RST and DT.

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