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An Adaptive Distributed Incremental Association Rule Mining System

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Abstract : Most existing Distributed Association Rule Mining (DARM) systems are still facing several challenges. One of such challenges that have not received the attention of many researchers is the inability of existing systems to adapt to constantly changing databases and mining environments. In this work, an Adaptive Incremental Mining Algorithm (AIMA) is therefore proposed to address these problems. AIMA employed multiple mobile agents for the entire mining process. AIMA was designed to adapt to changes in the distributed databases by mining only the incremental database updates and using this to update the existing rules in order to improve the overall response time of the DARM system. In AIMA, global association rules were integrated incrementally from one data site to another through Results Integration Coordinating Agents. The mining agents in AIMA were made adaptive by defining mining goals with reasoning and behavioral capabilities and protocols that enabled them to either maintain or change their goals. AIMA employed Java Agent Development Environment Extension for designing the internal agents' architecture. Results from experiments conducted on real datasets showed that the adaptive system, AIMA performed better than the non-adaptive systems with lower communication costs and higher task completion rates.

Keywords : adaptivity, data mining, distributed association rule mining, incremental mining, mobile agents
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