

A Knowledge Discovery Perspective in Data Mining

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Recent advances in knowledge discovery from dynamic, disparate data sources are reviewed. The data source types include digital data from sensor networks, text, static images, and video. The applications of the techniques include national defense, homeland security, energy assurance, and biomedical. The challenges in obtaining actionable insights in fusing such data include the collection, management, and dissemination of the data to the appropriate people in a meaningful time frame. Several current trends and approaches are discussed. In addition to the data systems challenge and the data analytics needs, the role of modeling and simulation in knowledge discovery is presented. Examples are shown that illustrate the growing roles of agent-based and discrete-event models for a wide spectrum of applications such as emergent behavior in social systems and asset tracking.