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FREQUENT SPATIO-TEMPORAL PATTERNS USING STP MINING ALGORITHMS

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Abstract

In many applications that track and analyze spatiotemporal data, movements obey periodic patterns; the objects follow the same routes (approximately) over regular time intervals. For example, people wake up at the same time and follow more or less the same route to their work every day. The discovery of hidden periodic patterns in spatiotemporal data could unveil important information to the data analyst. Existing approaches for discovering periodic patterns focus on symbol sequences. However, these methods cannot directly be applied to a spatiotemporal sequence because of the fuzziness of spatial locations in the sequence. In this paper, we define the problem of mining periodic patterns in spatiotemporal data and propose an effective and efficient algorithm for retrieving maximal periodic patterns. In addition, we study two interesting variants of the problem. The first is the retrieval of periodic patterns that are frequent only during a continuous subinterval of the whole history. The second problem is the discovery of periodic patterns, whose instances may be shifted or distorted. We demonstrate how our mining technique can be adapted for these variants. Finally, we present a comprehensive experimental evaluation, where we show the effectiveness and efficiency of the proposed techniques

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Keywords : Data Mining , periodic patterns , spatiotemporal data.