Complete Closed Time Intervals-Related Patterns Mining

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Through temporal abstraction, various forms of multivariate temporal data can be transformed into a uniform representation of symbolic time intervals series, from which *Time Intervals-Related Patterns (TIRPs)* can be then discovered. Hence, TIRPs mining offers a comprehensive framework for heterogeneous multivariate temporal data analysis. In this work we introduce *TIRPClo* – an efficient algorithm for the complete discovery of only the frequent *closed* TIRPs, a compact subset of all the frequent TIRPs based on which their complete information can be revealed. The algorithm utilizes a memory-efficient index, and a novel method for data projection, which makes it the first algorithm to guarantee a complete discovery of frequent closed TIRPs. In addition, a rigorous runtime comparison of TIRPClo to state-of-the-art methods [1,3,4] is performed, demonstrating significant speed-ups on eleven real-world datasets. This work has been recently published in The Thirty-Fifth Conference of the American Association of Artificial Intelligence (AAAI 2021) [2].

References

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