

framework, a digital map with topological structure of the road network is required such that the target trajectory can be transformed into a sequence of road segment using map matching algorithms [5, 11, 17, 23, 26]. PRESS separates the spatio-temporal information of a given trajectory into spatial path and time sequence, which are then compressed by Hybrid Spatial Compression (HSC) algorithm and error Bounded Temporal Compression (BTC) algorithm respectively, achieving spatial lossless and temporal error-bounded compression. However, the pre-computation and storage of all-pair shortest paths and most frequent paths require a stable road network and large memory space to be available, which limits the applied scenarios of PRESS.

8 CONCLUSION AND FUTURE WORK

In this paper we propose a novel data-driven framework, called REST, to compress the spatio-temporal trajectories. In order to achieve high effectiveness and efficiency, we addressed a few challenges by proposing different strategies to construct a compact but expressive reference set, and designing efficient and optimal algorithms to represent a given trajectory with selected matchable reference trajectories. To the best of our knowledge, it is the first data-drive approach to compress trajectories in unconstrained space with both spatial and temporal dimensions considered. Extensive empirical study based on real trajectories dataset confirms the superiority of our proposed framework over the state-of-the-art approaches in terms of compression ratio, efficiency and space cost. Since the compressed trajectories are in the form of sequence of reference trajectories, our next step is to develop effective indexing structures to support efficient query processing over compressed trajectories without full decompression.

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