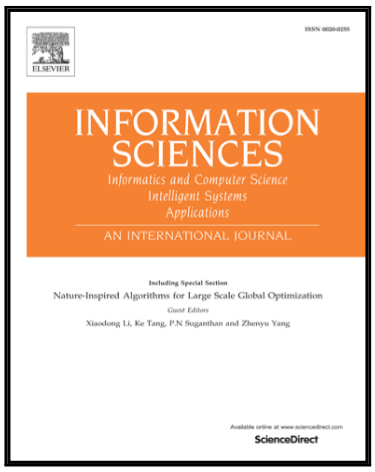

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Spatial-Temporal Data-driven Service Recommendation with Privacy-preservation

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Abstract. The ever-increasing popularity of web service sharing communities have produced a considerable amount of web services that share similar functionalities but vary in Quality of Services (QoS) performances. To alleviate the heavy service selection burden on users, lightweight recommendation ideas, e.g., Collaborative Filtering (CF) have been developed to aid users to select their preferred services. However, existing CF methods often face two challenges. First, service QoS is often context-aware and hence depends on the spatial and temporal information of service invocations heavily. While it requires challenging efforts to integrate both spatial and temporal information into service recommendation decision-making process simultaneously. Second, the location-aware and time-aware QoS data often contain partial sensitive information of users, which raise an emergent privacy-preservation requirement when performing service recommendations. In view of above two challenges, in this paper, we integrate the spatial-temporal information of QoS data and Locality-Sensitive Hashing (LSH) into recommendation domain and bring forth a location-aware and time-aware recommendation approach considering privacy concerns. At last, a set of experiments conducted on well-known WS-DREAM dataset show the feasibility of our approach.

Keywords: Service recommendation, Spatial-Temporal QoS, Locality-Sensitive Hashing, Privacy-preservation, Collaborative Filtering.

1 Introduction

With the increasing maturity and popularization of web of things, many software developers or vendors have begun to encapsulate their software tools or program interfaces into lightweight web services that can be accessed easily, and register them in