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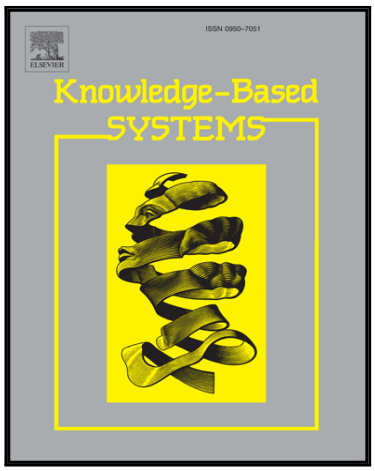

Privacy-preserving Trend Surface Analysis on Partitioned Data

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PII: S0950-7051(17)30596-8
DOI: 10.1016/j.knosys.2017.12.018
Reference: KNOSYS 4154

To appear in: *Knowledge-Based Systems*

Received date: 9 May 2017
Revised date: 12 December 2017
Accepted date: 15 December 2017

Please cite this article as: Salih Demir, Bulent Tugrul, Privacy-preserving Trend Surface Analysis on Partitioned Data, *Knowledge-Based Systems* (2017), doi: 10.1016/j.knosys.2017.12.018

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Privacy-preserving Trend Surface Analysis on Partitioned Data

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Abstract

Spatial interpolation methods which are one of most commonly applied functions of Geographic information systems(GIS) provide prediction values for unmeasured coordinates. Reliability and robustness of all spatial interpolation methods depend on the total amount of data collected in the interested region. Obtaining such valuable spatial data may require a vast of amount time and budget. In some situations, institutions even competing ones may collect data from the same region. If data collected by such organizations can be integrated, they will have more accurate prediction models. However, they may not to share such valuable information with other institutions or companies due to privacy concern. Additionally, in some countries there are laws against sharing private data especially health and financial records. Therefore, a privacy-preserving solution which offers confidentiality of both parties' data may induce them to collaborate. Furthermore, our solution protects the client's privacy who requests predictions from such institutions. In this study, we propose a privacy-preserving Trend surface analysis method that provides privacy of both clients and data holders. In addition to this, our solution will produce more accurate and reliable predictions on combined data of two data holders without violating their privacy. We analyses our solution in terms of performance, privacy and accuracy. Although privacy-preserving solution may bring extra storage,

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