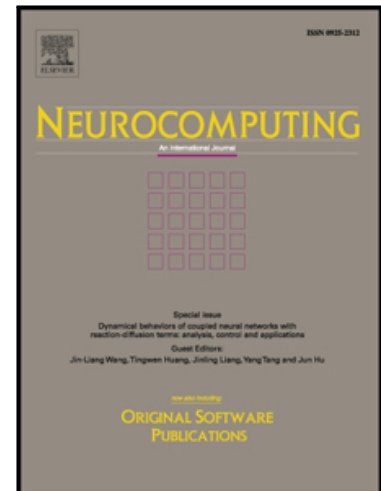


Accepted Manuscript

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PII: S0925-2312(18)30888-9
DOI: <https://doi.org/10.1016/j.neucom.2018.07.053>
Reference: NEUCOM 19806



To appear in: *Neurocomputing*

Received date: 4 May 2018
Revised date: 21 June 2018
Accepted date: 3 July 2018

Please cite this article as: Gangquan Si, Kai Zheng, Zhou Zhou, Chengjie Pan, Xiang Xu, Kai Qu, Yanbin Zhang, Three-dimensional piecewise cloud representation for time series data mining, *Neurocomputing* (2018), doi: <https://doi.org/10.1016/j.neucom.2018.07.053>

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Abstract

Many researchers have taken interests in time series data mining to discover potential knowledge and information as the amount of data from various domains rapidly increases. Representation, as a necessary implementation component of data mining, is critical to reduce the high dimensionality of time series data and generate a corresponding distance measure to process time series data effectively and efficiently. Many high-level representation approaches for mining time series data have been proposed in the past decades, e.g., PAA, SAX, PWCA and 2D-NCR. In this paper, a novel representation method for time series data, which is named Three-Dimensional Piecewise Cloud Representation (TDPCR), is proposed. The new representation contains a flexible partitioning strategy which protects the connection information between consecutive points by overlapping two adjacent segments. Using the improved cloud model theory, the proposed representation achieves the reduction of the data dimensionality and captures distribution and variation features of segments. Furthermore, a new distance measure, which has adaptive weight factors to adjust the proportion of data information, is defined to describe the relationship between two three-dimensional clouds. Accompanied with the comparisons of state-of-the-art representation methods, a sufficient performance evaluation for the proposed representation is

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