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## Time series data intelligent clustering algorithm for landslide displacement prediction

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JOURNAL OF INTELLIGENT &amp; FUZZY SYSTEMS

Volume: 35 Issue: 4 Pages: 4131-4140

DOI: 10.3233/JIFS-169734

Published: 2018

Document Type: Article

[View Journal Impact](#)

### Abstract

The traditional time series data clustering for landslide displacement prediction is based on Euclidean distance measure. The time series data is clustered by distance calculation of two vectors. The correlation between components is not considered. The multiple components with single feature will interfere with the clustering results, and the accuracy of clustering results is greatly reduced. To address this problem, an intelligent clustering algorithm for time series data in landslide displacement prediction based on nonlinear dynamic time bending is proposed in this paper. By reconstructing the phase space of the landslide displacement time series, the phase space transposed matrix is obtained as the time series reconstruction matrix. After embedding dimension processing, the time series of landslide displacement is predicted by SVM data mining model. Dynamic time warping calculation is based on the correlation of time series sequence and the components. The local optimal solution is obtained by recursive search, and the whole curve path is obtained. Clustering calculation of time series data set is carried out by using hierarchical clustering algorithm according to bending path. The intelligent clustering results of time series data in landslide displacement prediction is obtained. Experimental results show that the proposed algorithm has better clustering effect and higher clustering accuracy.

### Keywords

**Author Keywords:** Landslide displacement; time series data; intelligent clustering; nonlinear; dynamic time bending; hierarchical clustering algorithm

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### Funding

Funding Agency	Grant Number
National Key Research and Development Plan	2016YFC0501103
National Natural Science Foundation of China	51674245
Natural Science Foundation of Jiangsu Province	BK20160259
Priority Academic Program Development of Jiangsu Higher Education Institutions (PAPD)	
Fundamental Research Funds for the Central Universities	2014XT01

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