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## 管道流量泄漏时间序列分类的算法研究

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**摘要** 时间序列分类比一般分类问题困难, 主要在于要分类的时间序列数据不等长, 因此不能直接应用一般的分类算法。首先提出基于聚类模型的数据转换, 然后进行基于模型的聚类分析, 用领域相关法对时间序列建模, 用模型参数组成等长向量来表示每条序列, 最后进行时间序列匹配算法分析, 用分类算法进行训练和分类。结合管道流量泄漏点提出一种时间序列匹配的新方法, 利用同类样本间的连续性规律, 将时间序列排序, 并在相邻的时间序列之间添加样本点, 新方法优于基于动态时间弯折的传统方法; 针对管道流量泄漏时间序列分类的算法研究观测到不同算法在不同因素影响下的性能表现, 为今后发展新的算法提供有力依据。

**关键词** [时间序列](#) [基于模型聚类](#) [马尔可夫模型](#) [动态时间弯折](#)

分类号

## Arithmetic study on time series classification based on pipeline flux leak

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### Abstract

Compared to traditional classification problems, time series classification poses additional difficulties. A major difficulty is due to the fact that the time sequences are variable in length, making many traditional classification methods unable to apply directly. In this paper, the data conversion based on the cluster model is presented, and then model-based cluster analysis is given, time series modeling is made with domain method, model parameters with composition of each vector is used to express sequence, the final time series matching algorithm analysis is given, classification algorithm is used for training and classification. Based on pipe flow of leakage point a time-series match, new methods is proposed, according continuity of similar samples time sequence is sorted, and the samples is inserted between adjacent samples. The new method is superior than the traditional method based on dynamic time bending.

**Key words** [time series](#) [model based clustering](#) [Markov model](#) [dynamic time warping](#)

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