基于支持向量机的桥梁健康监测系统残缺数据填补

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摘 要：

针对桥梁健康监测系统中采集数据具有小样本、非线性且时序的特点，提出一种基于支持向量机的残缺数据填补方法,在分析数据的自相关性基础上，利用支持向量回归机原理，选择适当维数的样本作为支持向量机的输入向量，据此进行了残缺数据的预测；并与BP神经网络的填补效果相比较，实验结果显示了支持向量机在更小样本情况下填补残缺数据的优势和强泛化能力。

关键词：桥梁健康监测系统; 缺失数据填补; 时间序列; 支持向量机

Missing data imputation in bridge health monitoring system based on the support vector machine

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Abstract:

In bridge health monitoring system,data possesses the features of small sample, nonlinear and sequential. A missing data imputation method based on the support vector machine is presented in this paper. It will analysis the autocorrelation of the data and choose the appropriate dimensions of the sample as inputs to the calculated mode which is given out by the principle of support vector regression machine. The model was utilized to forecast the missing data. Compared with the results of BP neural network's imputation, the experimental results of support vector machine in filling of missing data show that it has advantages on smaller samples and higher generalization ability.

Keywords: Bridge Health Monitoring System; Missing Data Imputation;Time Series;Support Vector Machine

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