计算机工程与应用 2007 43 (15): 12-14 ISSN: 1002-8331 CN: 11-2127/TP

博士论坛

基于PSO-SVM的短期交通流预测方法

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收稿日期 修回日期 网络版发布日期 2007-5-9 接受日期

摘要 准确的交通流量预测是智能交通系统中的关键问题。在分析支持向量机SVM回归估计方法参数性能的基础上，提出了粒子群算法PSO优化参数的PSO-SVM短期交通流预测模型。模型利用支持向量机具有结构风险最小化的特性和粒子群算法快速全局优化特点，实现了数据降维并且保持了交通流序列的特征，因此可以高效地预测交通流量。用G107国道现场采集的数据仿真表明了该模型的有效性，预测平均误差为3.4%。

关键词 粒子群优化 交通流预测 支持向量机 参数优化

分类号

SVM based on PSO and its application in traffic flow predication

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Abstract

The accurate predication of short-term traffic flow is essential in ITS.On the basis of analyzing the parameter performance of Support Vector Machine（SVM） for regression estimation，the paper proposes a short-term traffic flow predication model based on PSO-SVM.The parameter of SVM is optimized by using Particle Swarm Optimization（PSO）.The method takes advantage of the minimum structure risk of SVM and the quickly globally optimizing ability of PSO.As the proposed model can reduce the dimensionality of data space and preserve features of traffic flow time series，it can predict traffic flow efficiently.The simulation results of traffic flow collected from Chinese national highway G107 prove its validity.The average predication error is 3.4%.

Key words Particle Swarm Optimization traffic flow predication Support Vector Machine parameters optimization

DOI:

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