多类分类SVM在工程车辆自动变速挡位决策中的应用

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关键词： 工程车辆 自动变速 挡位决策 支持向量机 二叉数

摘 要： 经典的支持向量机(SVM)是针对二类分类的，在解决工程车辆自动变速挡位决策这种典型的多类分类问题时存在困难。本文提出了基于二叉数支持向量机的挡位决策算法，将分类器分布在各个节点上，从而构成了多类分类支持向量机，减少了分类器数量和重复训练样本的数量。该方法能够根据车辆的运行状态确定最佳挡位，从而及时、准确地满足工程车辆自动换挡的要求。试验结果表明：基于二叉树的支持向量机性能要比遗传RBF神经网络略好。

The traditional support vector machines only deals with the binary classification. It has difficulty in solving the multi-class classification problem like the shift decision for the automatic transmission of the engineering vehicle. A shift decision algorithm that based on SVM-binary tree was presented. This method distributed classifier to nodes that constituted multi-class SVM. The number of SVM classifier and duplicated training samples could be reduced. The optimal shifting gear could be decided by the proposed approach, and the requirement of the engineering vehicle to the automatic shifting could be satisfied in time and accurately. The experiment showed that the support vector machines based on binary tree achieved better results than RBF neural network with genetics.

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