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学术探讨

R-SVR中*r*与输入噪声间近似线性反比关系

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摘要 为使*r*范数SVR更具鲁棒性，深入研究了*r*范数SVR中参数与输入噪声之间的关系。运用SVR的贝叶斯框架，分别推导出了鲁棒的*r*范数SVR中参数*r*与拉斯噪声和均匀噪声之间呈近似的线性反比关系。并结合仿真结果和已有的相关结论，得到了更为一般的结论，即鲁棒的*r*范数SVR中参数*r*与输入噪声之间呈近似的线性反比关系。这一结论为输入样本含有分布未知噪声的情况下*r*范数SVR参数的选择提供了理论依据。

关键词 支持向量机 支持向量回归机 *r*范数损失函数

分类号

Approximately linear dependency between *r* and input noise in r-Support Vector Regression

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Abstract

The dependency relationship between *r* and the input noise in r-SVR is studied using SVR Bayesian evidence framework.First，focus is paid on the cases of laplacian noise and uniform noise，and the approximately inversely linear dependencies between *r* and the variances of the two noises are then respectively derived.Second，with the relevant conclusion on r-SVR and experimental study，the more general claim is then proposed that the approximately inversely linear dependency is almost kept between *r* and the input noise in r-SVR.Such a dependency relationship is useful to determine the optimal choice for *r* in Norm-r loss function in the existence of unknown input noise.

Key words Support Vector Machines（SVM） Support Vector Regression（SVR） Norm-r function

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