论文

# 露天采矿爆破振动对民房破坏的LS-SVM预测模型

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摘要：

利用支持向量机学习原理，研究露天采矿爆破振动对民房破坏的预测问题。选取爆破振动幅值、主频率、主频率持续时间、灰缝强度、砖墙面积率、房屋高度、屋盖形式、圈梁构造柱、施工质量和场地条件作为露天采矿爆破振动对民房破坏的影响因素，以工程实际检测数据为训练样本，建立露天采矿爆破振动对民房破坏的LS-SVM预测模型。利用32组爆破实验数据作为学习样本对支持向量机进行训练，建立相应的预测模型并通过回代估计方法进行回检，误判率为0，用另外12组现场实验数据作为检验样本进行测试，测试结果良好。结果表明，LS-SVM预测方法的误判率低，判别精度高，为露天采矿爆破振动对民房破坏预测提供了一种行之有效的新方法，可以在实际相关工程中展开使用。

关键词： 露天采矿；爆破振动；民房破坏；LS-SVM

# LS-SVM analysis model and its application for prediction residential house's damage against blasting vibration from open pit mining

Abstract:

Based on the LS-SVM theory，raised its application for prediction residential house's damage against blasting vibration of open pit mining.Ten indexes，i.e.，blasting vibration amplitude，dominant frequency，dominant frequency duration，gray joints intensity，the rate of brick walls，height of housing，roof forms，the structural column of circle beam，the quality of construction and site conditions，were used as blasting vibration prediction of residential house's damage discriminating factors.With the engineering practice test data for the training sample，built the LS- SVM forecasting model of residential house's damage against blasting vibration of open pit mining.A LS-SVM model was obtained through training 32 measured data of blasting vibration.The re substitution method was introduced to verify the stability of LS-SVM model(false rate was 0)and was used to discriminate 12 new samples，test results was good.The results show that the ratio of mis discrimination is lower，and the prediction results are identical with actual results.The LS-SVM model has good classifying performance，high predicted accuracy and can be used in practical blast engineering.

Keywords: open pit mining；blasting vibration；residential house's damage；LS-SVM

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