Bousquet, Olivier; **Elisseeff, André**
Stability and generalization. (English) Zbl 1007.68083
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Summary: We define notions of stability for learning algorithms and show how to use these notions to derive generalization error bounds based on the empirical error and the leave-one-out error. The methods we use can be applied in the regression framework as well as in the classification one when the classifier is obtained by thresholding a real-valued function. We study the stability properties of large classes of learning algorithms such as regularization based algorithms. In particular, we focus on Hilbert space regularization and Kullback-Leibler regularization. We demonstrate how to apply the results to SVM for regression and classification.

MSC:

68Q32 Computational learning theory
68T05 Learning and adaptive systems in artificial intelligence
68W05 Nonnumerical algorithms

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