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Performance and optimization of support vector machines in high-energy physics classification problems

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ABSTRACT: In this paper we promote the use of Support Vector Machines (SVM) as a machine learning tool for searches in high-energy physics. As an example for a newphysics search we discuss the popular case of Supersymmetry at the Large Hadron Collider. We demonstrate that the SVM is a valuable tool and show that an automated discoverysignificance based optimization of the SVM hyper-parameters is a highly efficient way to prepare an SVM for such applications.

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