

On Interpretability in Data Analytics

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Abstract

An important challenge in Data Analytics is to make classification and prediction algorithms more interpretable, in the sense that we should know which attributes, and at which extent, contribute in the prediction. A powerful tool to attain this aim is Mathematical Optimization, which allows us to pose in a natural way the multiobjective problem of optimizing the performance and, at the same time, the number of attributes or measurement costs.

In this course we will illustrate the use of Mathematical Optimization strategies in different problems, such as dimensionality reduction (sparse PCA), sparse linear models with performance constraints, cost-sensitive Support Vector Machines with performance constraints or functional data, sparse classification and regression trees, interpretable clustering, etc., with special focus on the methods developed by the research group in Optimization in IMUS, the Institute of Mathematics of the University of Seville.