

Multi-output learning via spectral filtering

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Received: 27 October 2009 / Accepted: 14 February 2012 / Published online: 28 March 2012
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Abstract In this paper we study a class of regularized kernel methods for multi-output learning which are based on filtering the spectrum of the kernel matrix. The considered methods include Tikhonov regularization as a special case, as well as interesting alternatives such as vector-valued extensions of L2 boosting and other iterative schemes. Computational properties are discussed for various examples of kernels for vector-valued functions and the benefits of iterative techniques are illustrated. Generalizing previous results for the scalar case, we show a finite sample bound for the excess risk of the obtained estimator, which allows to prove consistency both for regression and multi-category classification. Finally, we present some promising results of the proposed algorithms on artificial and real data.

Keywords Vector-valued functions · Multi-task · Regularization · Spectral filtering · Kernel methods

Editor: Thomas Gaertner.

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