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Sergei V. Pereverzev* (sergei.pereverzyev@oeaw.ac.at), Johann Radon Institute,
Altenbergerstrasse 69, 4040 Linz, Austria.

Title: Adaptive kernel methods using the balancing principle.

In Tikhonov type regularization methods an approximate solution for some ill-posed problem is constructed as a minimizer of the sum of a discrepancy and a penalty. Usually the form of a penalty term is assumed to be given a priori. In the context of Learning theory the use of Tikhonov regularization leads to the learning algorithm known as Regularization Networks. In this algorithm the penalty is usually the norm of some Reproducing Kernel Hilbert Space (RKHS), where one is looking for a learner. In several practically important applications the kernel generating RKHS-norm is not known a priori. In the talk we are going to discuss two approaches to a data-driven choice of a penalty in RKHS-based Tikhonov regularization. In both these approaches we use the Balancing principle for the choice of regularization parameter that recently attracts an attention in the Regularization theory.

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