ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

INVITATION TO THE DOCTORAL SEMINAR

Semidefinite Programming: The Key to Semi-Supervised Support Vector Machines

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Chaired by Angelika Wiegele | Department of Mathematics

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ABSTRACT

Support vector machines (SVMs) are well-studied supervised learning models for binary classification. They have proven to be powerful machine learning techniques and highly efficient algorithms exist to solve the occurring optimization problems. However, most data in real life are unclassified, leading to semi-supervised support vector machines (S3VMs) instead. State-of-the-art MIP and MINLP solvers can only solve small S3VM instances to optimality. In this talk, we a present a new branch-and-cut approach for S3VMs using semidefinite programming relaxations. At each branch-and-bound node, we strengthen the bounds by adding RLT cutting planes and applying bound tigthening techniques. We provide numerical results showing that our approach is capable of producing very small duality gaps for real-world instances. Moreover, we solve S3VM instances with ten times more data points to optimality than possible before.

We hope to see you there!

