YURIY ZINCHENKO, University of Calgary, Gurobi LLC
Towards efficient approximation of p-cones

2-norm cone, a.k.a. the second-order cone (SOC), gained wide applicability in modern optimization. SOC may be effectively handled directly by interior-point methods as well as can be well approximated with polyhedra. Specifically, Ben-Tal and Nemirovski constructed an elegant 'optimal' efficient approximation scheme where the number of required linear inequalities grows only logarithmically with respect to the desired approximation precision. In contrast, the situation with SOC extensions to p-norm cones remained dramatically different: despite applications being present, our capacity to handle these cones is somewhat limited. Neither there are dimension-invariant self-concordant barriers known for such cones, nor has one been able to approximate these cones efficiently. In this work, we describe a few novel approaches aimed at constructing good approximations to p-cones, and provide evidence that indeed an efficient polyhedral approximation may be within reach for such cones.