

Cone Linear Optimization (CLO): From LO, SOCO and SDO towards Mixed Integer CLO

P. Belotti¹, J. Góez², I. Pólik², and T. Terlaky²

Abstract: Cone Linear Optimization (CLO) has been the subject of intense study in the past two decades. Interior Point Methods (IPMs) provide polynomial time algorithms in theory, and powerful software tools in computational practice. The applications of Second-Order Conic (SOCO) and Semi-Definite Optimization (SDO) expanded rapidly. The first part of this talk reviews how SOCO and SDO models can be formed model. We shortly discuss some important applications of CLO, review fundamentals and complexity of IPM, and review shortly available CLO software.

The use of integer variables naturally occur in CLO problems, just as in linear and non-linear optimization, thus the need for dedicated mixed integer CLO algorithms and software is evident. The second part of this talk gives some insight of how to design disjunctive conic cuts for mixed integer CLO problems, and what is the complexity of identifying disjunctive conic cuts. The novel disjunctive conic cuts may be used to design Branch-and-Cut algorithms for CLO Problems

¹ Department of Mathematics
Clemson University, Clemson, SC
pbelott@clemson.edu

² Department of Industrial and Systems Engineering
P.C. Rossin College of Engineering and Applied Science
Lehigh University, Harold S. Mohler Laboratory
200 West Packer Avenue, Bethlehem, PA
terlaky@lehigh.edu

³ SAS Inc. Cary, NC
imre.polik@gmail.com