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Strong Duality and Minimal Representations for Cone Optimization

The elegant results for strong duality and strict complementarity for LP can fail for cone programming over nonpolyhedral cones. We take a fresh look at known and new results for duality, optimality, constraint qualifications, and strict complementarity. These results include:

- weakest and universal CQs;
- duality and characterizations of optimality that hold without any CQ;
- geometry of nice and devious cones;
- the geometric relationships between zero duality gaps, strict complementarity, and the facial structure of cones; and
- the connection between theory and empirical evidence for lack of a CQ and failure of strict complementarity.