Linear complementarity problems, applications and formulations

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The Linear Complementarity Problem (LCP) consists of finding two nonnegative vectorsatisfying linear constraints and complementarity conditions between pairs of components of the same order. The LCP has found many applications in several areas of science, engineering, finance and economics. In this talk the LCP and some important extensions of this problem are first introduced together with some of themost relevant properties and applications.

A number of formulations of optimization problems are shown to be formulated as a LCP or one of its extensions. These include Linear and Quadratic Programming, Affin Variational Inequalities, Bilevel Programming, Bilinear Programming, 0-1 Integer Programming, Fixed-Charge Problems, Absolute Value Programming, Copositive Programming, Fractional Quadratic Programming, Linear and Total Least-Squares Problems, Eigenvalue Complementarity Problems, Matrix Condition Number Estimation, Clique and Independent Numbers of a Graph and Mathematical Programming with Cardinality Constraints. The benefits or drawbacks of using these formulations for solving these optimization problems are discussed in this talk.

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