Invited Talk Abstract

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Linear Interior-Point Methods

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Date	July 29, 2026
Time	11:30–12:00
Session	Session 6
Venue	S102, Lecture Hall, Gong-Guan Campus, NTNU

Abstract

We study algorithms for linear programs of the form $\min c \cdot x$, $Ax = b$, $x \geq 0$, that access the right-hand side b and objective c only through linear comparisons. An algorithm that operates under this restriction is called a linear algorithm. Such an algorithm can query an oracle which, given vectors u and v and scalars z and y, returns the signs of $u \cdot b + z$ and $v \cdot c + y$. The simplex method, as well as several known strongly polynomial combinatorial algorithms, can be implemented in this model. We show that interior-point methods can likewise be adapted to run as linear algorithms, which yields faster algorithms for several classes of linear programs and, through the framework of Norton, Plotkin, and Tardos, extends the family of problems that admit strongly polynomial algorithms.