

AGCO Seminar

Speaker: Neil Olver, LSE.

Title: A strongly polynomial algorithm for the minimum-cost generalized flow problem.

Abstract:

We give a strongly polynomial algorithm for minimum cost generalized flow, and hence for optimizing any linear program with at most two non-zero entries per row, or at most two non-zero entries per column. Our result can be viewed as progress towards understanding whether all linear programs can be solved in strongly polynomial time, also referred to as Smale's 9th problem.

Our approach is based on the recent primal-dual interior point method (IPM) due to Allamigeon, Dadush, Loho, Natura and Végh (FOCS '22). They show that the number of iterations needed by the IPM can be bounded in terms of the straight line complexity of the central path; roughly speaking, this is the minimum number of pieces of any piecewise linear curve that multiplicatively approximates the central path. As our main contribution, we show that the straight line complexity of any minimum cost generalized flow instance is polynomial in the number of arcs and vertices.

Joint work with Daniel Dadush, Zhuan Khye Koh, Bento Natura and László Végh.

When: December 18, 3:00pm.

Where: Sala de Seminario Von Neumann, 7th floor, CMM, Av. Beauchef 851, torre norte.

