THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

C O L L O Q U I U M

Hamilton Oriented Path and Cycle Discrepancy of Digraphs

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Date:	April 10, 2026 (Friday)
Time:	4:00 – 5:00pm
Venue:	Room 210, Run Run Shaw Bldg., HKU

Abstract

Erdös (1963) initiated extensive graph discrepancy research on 2-edge-colored graphs. Gishboliner, Krivelevich, and Michaeli (JGT 2023) launched similar research on oriented graphs. They conjectured the following extension of Dirac's theorem: If D is an oriented graph on $n \geq 3$ vertices with minimum degree $\delta(D) \geq n/2$, then D contains a Hamilton oriented cycle with at least $\delta(D)$ arcs in the same direction. This conjecture was proved by Freschi and Lo (JCTB 2024) who posed an open problem to extend their result to an Ore-type condition. My co-authors and I proposed two conjectures for such extensions and proved some results which provide support to the conjectures. One of the conjectures was recently solved asymptotically by a group of researchers mainly from Shandong University.

For maximization of the number of arcs in the same direction in Hamilton oriented cycles and paths of semicomplete multipartite digraphs and locally semicomplete digraphs, my co-authors and I obtained characterizations which lead to polynomial-time algorithms. Note that the maximization problem is NP-hard for some other generalizations of tournaments.

Recently, my co-authors and I obtained new results on the topic for digraphs of independence number of at most 2. We posed a few open problems on the topic for digraphs with bounded independence number.

All are welcome