Institut für Diskrete Mathematik

Combinatorics Seminar

Friday 10th March 12:45

AE06 Steyrergasse 30, EG

Counting orientations of random graphs with no directed k-cycle

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Given an undirected graph G, an orientation of G is a digraph obtained by assigning a direction to each edge of G. Given a digraph H, we will denote by $D(G, H)$ the number of orientations of G which avoid a copy of H. In 1974, Erdős posed the problem of determining, for any fixed H, the maximum value of $D(G, H)$ where G ranges over all n-vertex graphs. This problem was exactly solved for large n when H is a tournament (orientation of a complete graph) by Alon and Yuster (2006), and asymptotically solved for all graphs H by Bucić, Janzer, and Sudakov (2023).

In this talk, we will study a random version of the problem, introduced in 2014 by Allen, Kohayakawa, Mota, and Parente. More specifically, letting $G(n, p)$ denote the binomial random graph, we will determine the behaviour of $D(G(n, p), H)$ in the case where H is a directed cycle. Based on joint work with Kohayakawa, Morris, and Mota (2020) and with Campos and Mota (2022+).

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