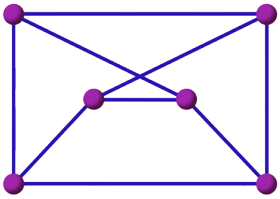

SEMINARIUM
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Directed graphs without rainbow triangles

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One of the most fundamental questions in graph theory is Mantel's theorem which determines the maximum number of edges in a triangle-free graph of order n. Recently a colourful variant of this problem has been solved. In such variant we consider k graphs on a common vertex set, thinking of each graph as edges in a distinct colour, and want to determine the smallest number of edges in each colour which guarantees existence of a rainbow triangle. In this talk we solve the analogous problem for directed graphs without rainbow triangles, either directed or transitive, for any number of colours. The constructions and proofs essentially differ for $k = 3$ and $k \geqslant 4$ and the type of the forbidden triangle.

This is joint work with Sebastian Babiński and Andrzej Grzesik.