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Graph Labelling with Combinatorial Nullstellensatz

Combinatorial Nullstellensatz is an algebraic technique developed by Alon and Tarsi in 1992. Alon named this method in 2001 when he demonstrated its applicability to a wide range of problems in additive number theory and graph theory. This is an early instance of what is now called the Polynomial Method, a general approach for applying algebraic geometry to solve problems in discrete mathematics. Roughly speaking, by strategically associating a set of discrete objects with a polynomial, one can utilize algebraic properties of the Nullstellen (zero locus). This talk will focus on applications of Combinatorial Nullstellensatz to graph labelling problems.