

# Crossing Numbers and Flag Algebras

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## **Abstract**

In this talk we explore applications of flag algebras to crossing numbers. Flag algebras is a framework developed by Razborov in 2007. It enables to find proofs that are based on sum of squares of densities of small substructures. It allows for computer assisted while utilizing semidefinite programming. The number of crossings in a fixed drawing of a graph  $G$  can be counted by checking every quadruple of vertices and checking if they induce a crossing. This leads to a density problem that can be formulated using flag algebras. In this talk, we introduce the method and visit several applications of the method to crossing numbers.