

N. El Maalouly : Exact Matching in Graphs with Small Independence Number

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In the Exact Matching problem, we are given a graph with edges colored red and blue, and an integer k . The goal is to output a perfect matching with exactly k red edges. After introducing the problem in 1982, Papadimitriou and Yannakakis conjectured it to be NP-hard. Soon after, however, Mulmuley et al. proved that it can be solved in randomized polynomial time, which makes it unlikely to be NP-hard. Determining whether Exact Matching is in P remains an open problem and very little progress has been made towards that goal. For special graph classes Yuster showed that Exact Matching is in P for $K_{3,3}$ -minor free graphs, which include planar graphs. Karzanov showed that it is in P for complete and bipartite complete graphs. In this talk I will show how to solve Exact Matching on graphs of bounded independence number and show ideas for how to get an FPT algorithm parameterized by the independence number.