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Planar F-Deletion:
Kernelization, Approximation and FPT Algorithms

Abstract:
In the F-Deletion problem you are given a graph G and integer k and asked whether there is a set S on at most k vertices such that G does not contain any minors from F, where F is a finite list of graphs. We show that if F contains at least one planar graph, then the F-Deletion problem admits polynomial kernels, constant factor approximation algorithms. If additionally all graphs in F are connected the F-Deletion problem admits $c^k{\cdot}n$ time FPT algorithms. On the way we develop some new and interesting tools. Our results are stringed together by a common theme of polynomial time preprocessing. In this talk we will give a brief introduction to techniques used.

(This is a joint work with Fedor V Fomin, Daniel Lokshtanov and Neeldhara Misra)