

Oberseminar Theoretische Informatik

Wintersemester 2008/2009

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On the Induced Matching Problem

Monday, October 27 at 2pm (c.t.)
in room 3319 (Ernst-Abbe-Platz 2, floor 3).

We study extremal questions on induced matchings in certain natural graph classes. We argue that these questions should be asked for twinless graphs, that is graphs not containing two vertices with the same neighborhood. We show that planar twinless graphs always contain an induced matching of size at least $n/40$ while there are planar twinless graphs that do not contain an induced matching of size $(n+10)/27$. We derive similar results for outerplanar graphs and graphs of bounded genus. These extremal results can be applied to the area of parameterized computation. For example, we show that the induced matching problem on planar graphs has a kernel of size at most $40k$ that is computable in linear time; this significantly improves the results of Moser and Sikdar (2007). We also show that we can decide in time $O(91^k + n)$ whether a planar graph contains an induced matching of size at least k .

Homepage:

<http://theinfl.informatik.uni-jena.de/teaching/ws0809/oberseminar-ws0809>