

## Oberseminar Theoretische Informatik

Wintersemester 2007/2008

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### The Parameterized Complexity of the Rectangle Stabbing Problem and its Variants

Mo, 04.02.2008 um 14 Uhr (c.t.) im SR 3319 (Ernst-Abbe-Platz 2, 3. Stock).

We study an NP-complete geometric covering problem called  $d$ -dimensional Rectangle Stabbing, where, given a set of axis-parallel  $d$ -dimensional hyperrectangles, a set of axis-parallel  $(d-1)$ -dimensional hyperplanes and a positive integer  $k$ , the question is whether one can select at most  $k$  of the hyperplanes such that every hyperrectangle is intersected by at least one of these hyperplanes. This problem is well-studied from the approximation point of view, while its parameterized complexity remained unexplored so far. Here we show, by giving a nontrivial reduction from a problem called Multicolored Clique, that for  $d \geq 3$  the problem is W[1]-hard with respect to the parameter  $k$ . For the case  $d = 2$ , whose parameterized complexity is still open, we consider several natural restrictions and show them to be fixed-parameter tractable.

Internetseite der Veranstaltung:

<http://theinf1.informatik.uni-jena.de/teaching/ws0708/oberseminar-ws0708>