

**Oberseminar Theoretische Informatik**  
Sommersemester 2006

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**Algorithm Engineering for Color-Coding with  
Applications to Signaling Pathway Detection**

Mo, 10.07.2006 um 14 Uhr (s.t.) im SR 226 (Carl-Zeiß-Str. 3, 2. Stock).

To identify candidates for linear signaling pathways in protein interaction networks, Scott et al. [RECOMB, 2005] recently proposed to extract paths with high interaction probabilities. To solve this NP-hard problem, they used an algorithmic technique known as color-coding. Their implementation of this technique is capable of finding biologically meaningful pathways of length up to 10 proteins within hours. We give various novel improvements for color-coding, both from a worst-case perspective as well as under practical considerations. Experiments on the interaction networks of yeast and fruit fly as well as a testbed of structurally comparable random networks demonstrate a speedup of the algorithm by orders of magnitude. This allows more complex and larger structures to be identified in reasonable time; finding paths of length up to 13 proteins can even be done in seconds and thus allows for interactive exploration and evaluation of pathway candidates.

Internetseite der Veranstaltung:

<http://theinf1.informatik.uni-jena.de/teaching/ss06/oberseminar-ss06>