

Institut für Optimierung und Diskrete Mathematik

Vortrag im Seminar Diskrete Mathematik und Optimierung

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## Bootstrap percolation on $k$ -uniform random Hypergraphs

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A bootstrap percolation process on a hypergraph  $H = H(V; E)$  with activation threshold an integer  $r \geq 1$  is a deterministic process which evolves in rounds. Every vertex is in one of two possible states: it is either infected or uninfected. The set of initially infected vertices is given by  $\mathcal{A}(0)$ . In each round of the process every uninfected vertex  $v$  which has at least  $r$  infected neighbours becomes infected. Once a vertex has become infected it remains infected forever. The process stops once no more vertices become infected.

We consider the case when the hypergraph  $H$  is a random  $k$ -uniform hypergraph and  $\mathcal{A}(0)$  consists of a given number of vertices chosen uniformly at random.

We generalize results by Janson, Łuczak, Turova and Vallier for bootstrap percolation on the binomial random graph. In particular we determine the critical threshold  $a_c$  such that if  $|\mathcal{A}(0)| \rightarrow (1 + \delta)a_c$  then with high probability almost every vertex becomes infected, while if  $|\mathcal{A}(0)| \rightarrow (1 - \delta)a_c$  then with high probability only a “few” additional vertices become infected.

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