Weight choosability of oriented hypergraphs

Marcin Anholcer

Poznań University of Economics and Business, Poland

The 1-2-3 conjecture states that every simple graph (with no isolated edges) has an edge weigthing by numbers $1, 2, 3$ such that the resulting weighted vertex degrees form a proper coloring of the graph. We study a similar problem for oriented hypergraphs. We prove that every oriented hypergraph has an edge weighting satisfying a similar condition, even if the weights are to be chosen from arbitrary lists of size two. The proof is based on the Combinatorial Nullstellensatz and a theorem of Schur for permanents of positive semi-definite matrices. We derive several consequences of the main result for uniform hypergraphs. We also point on possible applications of our results to problems of 1-2-3 type for non-oriented hypergraphs. This talk is an effect of collaboration with **Bartek Bosek** and **Jarek Grytczuk**.

m.anholcer@ue.poznan.pl