

# COMBINATORIAL ALGORITHM FOR RESTRICTED MAX-MIN FAIR ALLOCATION

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We study the basic allocation problem of assigning resources to players so as to maximize fairness. In this problem each resource has a value and can be assigned only to an item-dependent subset of players. The goal is to obtain an allocation that maximizes the minimum value a player receives where player valuations are additive. We design a constant factor approximation algorithm for this problem. Our approach develops a local search technique introduced by Haxell for hypergraph matchings, and later used in this context by Asadpour, Feige, and Saberi. Besides the improved approximation guarantee, the highlight of our approach is that it is purely combinatorial.

This is joint work with Christos Kalaitzis and Ola Svensson.