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# Nice labeling problem for event structures: a counterexample

Victor Chepoi

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In this note, we present a counterexample to a conjecture of Rozoy and Thiagarajan from 1991 (called also the nice labeling problem) asserting that any (coherent) event structure with finite degree admits a labeling with a finite number of labels, or equivalently, that there exists a function  $f: \mathbb{N} \mapsto \mathbb{N}$  such that an event structure with degree  $n$  admits a labeling with at most  $f(n)$  labels. Our counterexample is based on the Burling's construction from 1965 of 3-dimensional box hypergraphs with clique number 2 and arbitrarily large chromatic numbers and the bijection between domains of event structures and median graphs established by Barth'elemy and Constantin in 1993.

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