

Accidental formal concepts in the presence of counterexamples

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Accidental formal concept corresponds to a subset of attributes that accidentally appear in several objects (the parents of the concept) if every such an object is a parent of a different "real" formal concept. There are two standard techniques to forbid such concepts: counterexamples to exclude involved concepts and the lower bound on the number of parents. Both are insufficient. We define the random formal context with attributes (different from elements of "real" formal concepts) generated by independent Bernoulli variables. The main result has asymptotic form: If the the number n of the random attributes tends to infinity, the probability of success equals to $\sqrt{\frac{a}{n}}$, and there are $m = b/\sqrt{rtn}$ counterexamples, then the probability of appearance of an accidental formal concept with 2 parents avoiding these counterexamples is $1 - e^{-a} - a \cdot e^{-a} \cdot [1 - e^{-b \cdot \sqrt{a}}]$ at limit.