

Space Complexity in Propositional Calculus

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Abstract

We study space complexity in the framework of propositional proofs. We consider a natural model analogous to Turing machines with a read-only input tape, and such popular propositional proof systems as *resolutions*, *polynomial calculus* and *Frege* systems. We propose two different space measures, corresponding to the maximal number of bits, and clauses/monomials that need be kept in the memory simultaneously. We prove a number of lower and upper bounds in these models as well as some structural results concerning the clause space for resolution and Frege systems.