

## Q: solving SAT: generating extended resolution proofs using techniques for resolution?

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The most successful techniques for solving SAT to date work by searching for resolution refutations [1], [2], [3]. It is well known that resolution refutations are exponential length for some rather trivial problems (pigeon-hole, reordering XOR, reordering addition, etc).

Extended resolution is resolution allowing definition of new boolean variables. There are no problems in NP which are known to require exponential length extended resolution refutations (or at least, I do not know of any).

So I have been trying to find a way to extend the techniques which work so well at finding short resolution refutations to find short extended resolution refutation.

I would appreciate it if people could post advice for me or references or results which might be helpful to my quest.

References:

[1] Joao Silva, Karem Sakallah: GRASP – A New Search Algorithm for Satisfiability,  
1996 ICCAD proceedings

[2] Matthew Moskewicz, Conor Madigan, et al: Chaff – Engineering an Efficient SAT Solver

[3] Evgueni Goldberg, Yakov Novikov: BerkMin: a Fast and Robust Sat-Solver

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