

Re: solving SAT: generating extended resolution proofs using techniques for resolution?

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From: Will Naylor (pub_at_willnaylor.com)

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As my post states, "extended resolution" is resolution, but also allowing definition of a new boolean variable at any point in the proof. The definition of the new variable must not add any new information or restriction to the system.

For example:

Suppose your SAT problem contains the clauses

(A or !B or C)

(B or D or E)

Resolving on variable B implies the new clause

(A or C or D or E)

A "resolution proof" or "resolution refutation" is a sequence of such resolution steps that results in proving the empty clause.

Extended resolution allows the additional step of introducing a new boolean variable at any time.

For example, I could add $NEWVAR == A \text{ exclusive_or } B$, which in the language of SATISFIABILITY problem is these 4 clauses:

(A or B or !NEWVAR)

(A or !B or NEWVAR)

(!A or B or NEWVAR)

(!A or !B or !NEWVAR)

Resolution is weak in sense that many simple theorems that are easy to prove by other methods require proofs of exponential length in resolution. However, extended resolution can simulate most or all other methods of proof, and hence extended resolution has short proves for most or all theorems that have short proofs in other systems.

sci.math.symbolic: Re: solving SAT: generating extended resolution proofs using techniques for resolution?

Thomas A. Li wrote:

> *What is "Extended resolution"? Please give a definition or source of
> definition.*

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> *Thomas Li*

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> *"Will Naylor" <pub@willnaylor.com> wrote in message
> news:10veflhfkati29@corp.supernews.com...*

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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).*

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