Re: Optimizing Unit Clause Resolution

Source: http://sci.tech−archive.net/Archive/sci.math/2004−06/1151.html

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From: Jim Nastos (*nastos_at_cs.ualberta.ca*)
Date: 06/07/04

Date: Mon, 7 Jun 2004 01:46:25 −0600

On Mon, 7 Jun 2004, Russell Easterly wrote:

> *>*
> *> "Jim Nastos" <nastos@cs.ualberta.ca> wrote in message*
> *> news:Pine.LNX.4.44.0406051619160.32381−100000@tees.cs.ualberta.ca...*
> *>*
> *> > The well−known problem "exactly−one−SAT" is NP−complete and the*
> *> > reduction is straight from 3−SAT:*
> *> >*
> *> > To map a 3−SAT instance to an instance of EXACTLY−ONE−(OutOf3)−SAT:*
> *> >*
> *> > (a,b,c) −> (x,y,z) ^ (x, ~a, T1) ^ (y, ~b, T2) ^ (z, ~c, T3)*
> *> >*
> *> > where x,y,z,T1,T2,T3 are six new variables per clause.*
> *> > (So n variables, m clauses −> n+6m variables and 4m clauses).*
> *> >*
> *>*
> *> Would you please give a brief description of how x,y,z,T1,T2, and T3*
> *> are defined. I couldn't find a good description on the web.*

As it says, those six variables are totally new variables and they are entirely free. When converting any (a,b,c) clause, six NEW variables are used each time.

Verify for yourself that if (a,b,c) is satisfiable, then the left side has an exactly−one assignment, while if (a,b,c) is not satifiable, then the left side will be satisfied with some clause having more than one true variable.

J