

Re: Optimizing Unit Clause Resolution

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Jim Nastos <nastos@cs.ualberta.ca> wrote in
news:Pine.LNX.4.44.0406051619160.32381-100000@tees.cs.ualberta.ca:

- > *On Sat, 5 Jun 2004, Russell Easterly wrote:*
- >
- >> *I also show that certain 3SAT problems can be solved in polynomial*
- >> *time. Specifically, any 3SAT instance that has a satisfying*
- >> *assignment, such that exactly one member of each clause is satisfied,*
- >> *can be solved in poly time.*
- >>
- >> *For example, the one clause instance (A,B,C) has three such*
- >> *assignments: ~A,~B,C; ~A,B,~C; and A,~B,~C.*
- >>
- >> *Is there a well known class of 3SAT problems where exactly one member*
- >> *of each clause can be satisfied?*
- >
- > *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:*
- >
- > $(a,b,c) \rightarrow (x,y,z) \wedge (x, \sim a, T1) \wedge (y, \sim b, T2) \wedge (z, \sim c, T3)$
- >
- > *where x,y,z,T1,T2,T3 are six new variables per clause.*
- > *(So n variables, m clauses \rightarrow n+6m variables and 4m clauses).*

What the hell is this supposed to mean? Is \rightarrow supposed to be an implication operator? Is the right-hand operand supposed to be (x,y,z) or everything after \rightarrow ? Or is \rightarrow instead supposed to be an equivalence operator? What's the significance of using lower-case for some literals (a, b, c, x, y, z) and upper-case for others (T1, T2, T3)?

- > *Note that if the left side is satisfiable then the right side has an*
- > *exactly-one assignment. If the left side is not satisfiable, then the*
- > *right side will have to have at least two true variables in some*
- > *clause.*
- >
- > *So, you are claiming to have a polytime solution to an NP-complete*

sci.math: Re: Optimizing Unit Clause Resolution

- > *problem. I checked your page and find it hard to follow. Can you just*
- > *describe the algorithm without going to graphs? You have a cover set*
- > *and an anti-cover set, so can you just concisely write (something like*
- > *pseudo code) which variables get put into which set?*
- >
- > ***J***
- >