

Re: Is graph isomorphism in P?

Source: <http://sci.tech-archive.net/Archive/sci.math/2007-07/msg03206.html>

- *From:* Fra <fra.cristiano@xxxxxxxxx>
 - *Date:* Fri, 20 Jul 2007 09:11:23 -0000
-

On 20 Lug, 06:30, Proginoskes <CCHeck...@xxxxxxxxx> wrote:

Fra states: "In this site you will not find the algorithm or any explanation of it, I wish to use this forum in order to place in it hard instances of the MI problem that otherwise would require a prohibitively computation-time to solve it." This makes it hard for people to (1) find two graphs which are isomorphic, for which the algorithm fails to find the isomorphism, or (2) verify that the algorithm runs in polynomial time.

(1) in this page:

<http://isoproblem.freeforums.org/viewtopic.php?t=5>

I've suggested how to generate random adjacency matrices of bipartite graph (I means undirected graph). It requires only bit of seconds with octave; the only difficulty is to obtain matrices with no duplicate rows.

This problem can be avoided increasing the maximum numbers of '1' in each row in this octave instruction:

from:

```
M=round(randerr(300,300,3));
```

to

```
M=round(randerr(300,300,5));
```

for the (2)'s answer see below.

Fra invites people to post graphs to test his isomorphism program, adding: "please not post matrices with more than 350/400 rows, this because I've limited computing resources (only my laptop with 1,2 Gb RAM on AMD Athlon 64) to run the algorithm." Well, Fra, the isomorphism problem, where you only look at graphs with at most 400 vertices, can be solved in CONSTANT TIME.

Oh yes?! Please let me know how to find an isomorphism for this MI instance:

<http://isoproblem.freeforums.org/viewtopic.php?t=19>

Re: Is graph isomorphism in P?

in CONSTANT TIME.

I never meant that my algorithm can be solve GI problem with at most 400 vertices; I mean that: having only 1,2Gb of Ram, because algorithm is based on exploration of mathematical objects whose demanded of memory increases with vertices increasing, if I try to solve an MI instance for a 2000x2000 I'll get "Could not reserve enough space for object heap" by the java virtual machine.

Anyway, I've no problem to solve 600x600 or 1000x1000 MI instances, let me some hours and I will post here:

<http://isoproblem.freeforums.org/viewforum.php?f=1>

also a 600x600 MI problem on adjacency matrix of bipartite graphs.

If Fra is afraid that he's found a polynomial-time algorithm for testing graph isomorphism and someone will steal it, he should realize that posting it to Usenet (where the post will be dated) and/or sending himself a copy of that algorithm as a letter in the mail ("poor man's copyright") are both ways to later prove that he did come up with the algorithm first.

Sorry, but this is your personal interpretation.

The idea is that in this phase I wish to test the algorithm for "hard instances of the MI problem that otherwise would require a prohibitively computation-time to solve it". (it is written here: <http://isoproblem.freeforums.org/viewtopic.php?t=5>)

This indirectly can proof the polinomial-time nature of the algorithm.

(I.E. if for a 600x600 bipartite graph the world's fastest isomorphism testing program, that is Nauty, will need of thousand of years and I will give you an isomorphism in 6/7 hours, I think that this is really significant!)

Lastly, he says: "During my research I've found that is possible to give an algebraic characterization for every matrix involved in the MI problem and I've used it to solve the problem with a P-time algorithm (implemented in java)." This Java code should definitely be made public.

— Christopher Heckman

At the end of test phase, if the algorithm never fails, I'll publish all.

Re: Is graph isomorphism in P?

Fra

.