RE: About your work: Efficient Metaheuristics for Multi-stage No-Wait Flexible Flowshop Scheduling Problem

zakaria Dahi

Mar 15/12/2015, 10:30
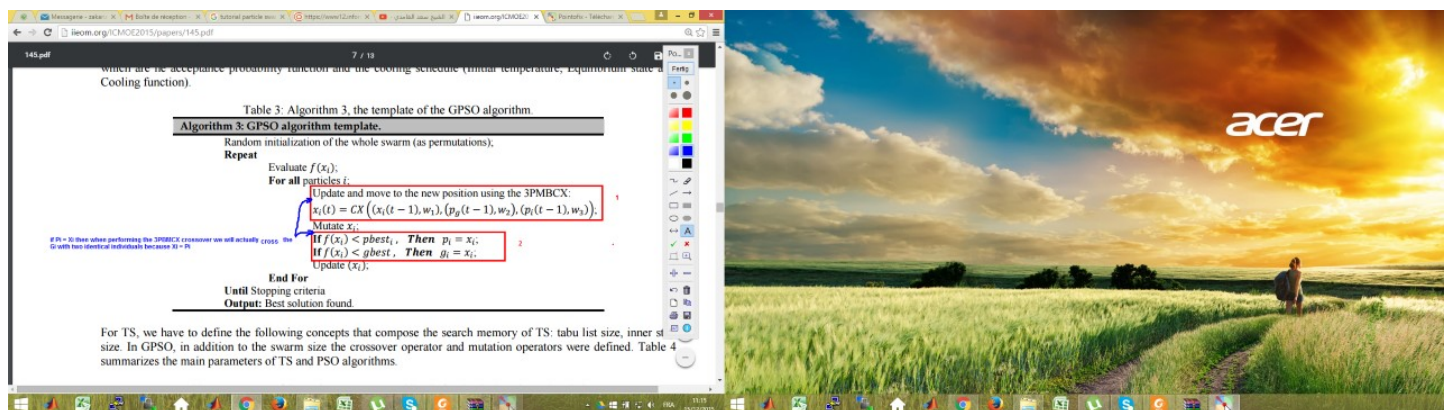
À :Mageed Ghaleb <mghaleb87@gmail.com>;

Dear Mr Mageed,

Firstly, thank you for you reply. However I still do not understand how the best solution found for a given swarm is different from the swarm itself. For me I analysed many times the code and it seems that they are inevitably the same. As I pointed in the figure joint in this e-mail, many issues are unclear for me sir:

- at iteration t = 0 when the first population is initialised, what is Pi for each particle ?
- After performing the 3PBMCX crossover (1), a condition is applied then (2) and if the particle is better than its best solution Pi, the latter will take the value of the first. So, when applying again the 3PBMCX crossover Pi = Xi. So, we will be crossing Gi with two identical particles.
- The same for Gi sir, after performing the 3PBMCX crossover (1), a condition is applied then (2) and if the particle is better than its best solution Gi, the latter will take the value of the first. So, we will be crossing Pi with two identical particles because Xi = Gi.
- Undesratnding the notion of Pi is even harder, since in my understanding the PSO as other metaheuristics is ellitist. Which means that the new solution is kept only if it better than the previous. So, in all cases the particle Xi is the best state it could be. So, what is the difference between the Xi and the Pi in reality.

Your answer sir will be of a huge help to me. While waiting for your reply, please accept my sincere salutations and respect.

Dear Dahi,

Firstly, thanks a lot for your interest.

Regarding the question, in PSO in general, updating any particle (swarm) position is of two steps. The first, is updating velocity of that particular swarm and to do that we need three things; the previous velocity of that swarm, the global best position (solution) found so far (among all the particles/swarms), and the best position (solution) found so far, but for that particular swarm only, not among all the swarm (and that what we call the historical best position found for a swarm). Now, after having the new velocity, the second step is updating the position by adding this velocity to the previous position.

Now in GPSO, like in many other variate of PSO to the combinatorial optimization, authors used some of the EAs (Evolutionary Algorithms) properties ,which are the crossover and the mutation properties, in order to establish the updating process. Going back to the updating process, we can find that there are Three vectors (or lets say parents as in EAs) needed to be processed in somehow to get the new position for the swarm. These parents are the current position (like in GPSO) or velocity (like other PSO variate), the the global best position (solution) found so far (among all the particles/swarms), and the best position (solution) found so far, but for that particular swarm only, not among all the swarm (or what we call the historical best position found for a swarm).

Unfortunately, we now that in EAs all the known crossover operators are working with Two parents only, but in GPSO the 3PMBCX can do the crossover across any number of parents we have (3 or even more) in only one step. Thus, GPSO is preferable compared to other PSO variate because the other PSO variate perform the crossover process in Two steps or even more unlike GPSO.

Hope that was helpful, and feel free asking any farther questions.

Best regards ..

Mageed

On Wed, Dec 9, 2015 at 9:16 PM, zakaria Dahi <dahi_zakaria@hotmail.fr> wrote:

Dear Sir,

Firstly, I would like to congratulate you in the name of all the scientific community for your intresting and relevant works.

My e-mail is about one of your works: ***Efficient Metaheuristics for Multi-stage No-Wait Flexible Flowshop Scheduling Problem***

My question if you do not mind is:

When performing the 3PMBCX crossover, what do you mean by the ***hi.*** You said that it is the historical best position found.

But since the GPSO is elitist and the solution is kept only if it is better than its previous one, so in other words the historical best position found ***hi*** is the actual solution itself. In this case the 3PMBCX crossover is a simple crossover between the solution ***Xi*** and the global best solution ***Gi.***

Pleasse if you do not mind sir, can you correct my understanding and make it clear for me ?

All, I want to know is what do you mean by the historical best position found ***hi.***

While waiting for your reply, please accept sir my sincere salutations and respect.