**SDST-HFSP**

The ASO algorithm was implemented to solve a variation to this problem which is called SDST-HFSP (Sequence Dependent Setup Time). This means that the jobs are sequence dependent and the machines have a setup time (the setup time it’s like a wait time in which the machine is prepared to be used), so with this variation we have two add this two constraints to the problem mentioned.

An advantage that this algorithm is a generalization of GA, we can relate job sequences and member’s positions by representing each scheduling solution by a chromosome

Mention that for the FI tha parameter Alpha is equals to 1.

Lets remember that for this MP we need to have a neighbooringh method for individuals that are not the best one and another for the one who is it. This let us explore better the solution space.

Now for the second MP we use the parameter delta as 1 leaving alone the coefficient of variation in the exponential.

And for the last MP the parameter Beta is equals to 0, which means that the member always Will choose it’s position based on its previous best.

The other algorithms used to compare their performance were the Simulated Annealing, PSO and the Hibryzed Tabu Search.

The plot at your right shows the average relative percentage of deviation for all the algorithms tested, as you can see the ASO has a little deviation, close to 1%, while other algorithms have a RPD above 4%. And in the other plot you can see the RPD for all the algorithms, tested with a different number of jobs, as you can se all RPD decrease by incrementing the number of jobs, being remarkable the proximity of the ASO to the 0% of deviation.

**Reservoir System**

The ASO algorithim has been implemented to optimize…

In the left image you can see the single-reservoir hydropower system Karun-4, located in Iran. The optimization of the Karun-4 reservoir with the objectivo of minimize the lack of productivity was performed by using the ASO algorithm and GA on monthly time steps for a five-year period. The objective function values of the ASO algorithm and the genetic algorithm (GA) for Karun-4 reservoir are 1.254 and 1.535, respectively. The objective function value from the ASO algorithm is very close to the global optimum (1.213).

At your right yo can see a four reservoir system with the objective of maximizing the benefits in an operation period of 12 months. The optimal solution of the ASO algorithm for the four-reservoir system covers 93.88% of the NLP value, while the GA model only accounts for 91.86% of the global optimum, indicating that the ASO algorithm does have better performance.

**Cloud Security**

In this ASO algorithm, virtual machines are chosen randomly within the solution space. Every VM in the cloud is viewed as a member that can be allotted for performing the various required subtasks. The proposed PASO algorithm attempts to discover optimal selection of VMs with reduced execution time and maximum resource utilization and to increase system efficiency.

In PASO, the parallel processing targets to produce the end result using more than one processor concurrently which is used to limit the running time. Then, the fitness of every member (VM) is determined. Fitness function (optimal selection of VMs) is computed by using utilization, turnaround time and weight time.