OPTIMIZATION WORLD RECORD FOR CI OWNERS

CI owners have set a new world-record in mathematical optimization. The target of the optimization was a data set of the 277 instances of the so-called SMPTSP problem. Top scientists have been trying to solve and find superior solutions for the instances.

The problem was published in 2001. In this practical problem the workers visit the clients to carry out tasks with specific time windows. The workers have specific skill sets, transportation types and availability intervals. Examples of such work include cleaning, home care, guarding, manufacturing, installation services, waste management and delivery of goods. SMPTSP is a scientific special case of these practical problems – even thousands of tasks need to be assigned to hundreds of workers in such a way that minimizes the number of workers to be used.

CI owners set the first world-record for the 47 most difficult instances of the data set.
The research results were published in Advances in Operations Research in 2021:
https://www.hindawi.com/journals/aor/2021/8876990/

The newest world-record was achieved solving the entire data set. For almost all of the known 277 benchmark instances, the heuristic found the optimum solution within ten seconds. The new GFA algorithm was able find all the optimal and best solutions obtained so far. In addition, the algorithm was able to find new optimum solutions for the first time, and two new best ever values.
The research results were published in the International Conference on Mathematics and Computers in Sciences and Industry in 2023:
https://www.computer.org/csdl/proceedings-article/mcsi/2023/416500a059/1VBjc4ger04

Contact: Cimmo Nurmi, CEO, cimmo@computationalintelligence.fi, +358 44 710 3371