

A Combined Local Search and Integer Programming Approach to the Traveling Tournament Problem

Marc Goerigk, Stephan Westphal

23.10.12

The traveling tournament problem is a well-known combinatorial optimization problem with application to sport leagues scheduling, that sparked intensive algorithmic research over the last decade. With the Challenge Traveling Tournament Instances as an established benchmark, the most successful approaches to the problem use meta-heuristics like tabu search or simulated annealing, partially heavily parallelized. Integer programming based methods on the other hand are hardly able to tackle larger benchmark instances.

In this work we present a hybrid approach that draws on the power of commercial integer programming solvers as well as the speed of local search heuristics. Our proposed method feeds the solution of one algorithm phase to the other one, until no further improvements can be made. The applicability of this method is demonstrated experimentally on the galaxy instance set, resulting in currently best known solutions for most of the considered instances.