Caixa Mágica
software

Summer Internships 2017

Schedule Optimiser

Weekly Report - 10/07/2017-14/07/2017 (Week 1)

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Summary:

The problem to solve is a variant of the well-known Job Shop Scheduling. The auto-scheduling algorithm implemented is not optimal, and as such, the objective is to improve the current existing schedule for every team, minimising the amount of resources wasted, without changing the schedule itself (note there's a distinction between the 2 type of schedules: the schedules of each team and the schedules appointed with each client).

The problem is NP-Hard. It's not currently known how to solve this kind of problems optimally, in a timely manner. The best existing option is to find sub-optimal solutions (better than the original) that are close to optimal.

Local search algorithms are likely the best approach to the problem. Local search algorithms operate using a single state (in our case a schedule) and try to improve that state through moving to neighbour states by performing simple actions on the current state (for example switching teams at an appointment). The most promising algorithms are:

1. Local Beam Search
2. Simulated Annealing
3. Genetic algorithms

Completed tasks:

- Study the available documentation and the architecture of the platform;
- Define the problem and find the best approach to solve it;
- Study the alternative solutions to this kind of problems.

To-do:

- Set-up the work environment;
- Analyse and chose one (or more) algorithm(s) to implement;
- Start implementing the algorithm(s).