Contribution ID: **74** Type: **Apresentação regular**

Rolling stock rotation planning in a regular operation context

The rolling stock rotation planning problem with maintenance constraints can be stated in the following way: given a set of train trips each one with its own passenger demand find, from scratch, for a standard week, the most cost-effective rotations that assign a vehicle composition (hereafter composition) to each trip that covers all or part of the demand and that satisfy all operational constraints, namely maintenance constraints and many others. The overall rotation cost includes aspects like track occupation, fleet depreciation, maintenance and energy consumption, crew utilization and uncovered demand.
Since the problem cannot be solved exactly, due to the size of problem instances and the complexity of maintenance constraints, we propose approximate solution methods. Our approaches take advantage of splitting the standard week into several subproblems involving one or more days. Furthermore, we consider the trips' regularity, meaning that there are exactly the same set of trips repeated on different days (e.g. weekdays usually have the same timetable every day).
Our solution methods were evaluated with problem instances from a European passenger railway operator that provides a regular service with multiple-unit trains. Results highlight the potential of the proposed approaches.

Authors: Mrs CARVALHO, Ana (SISCOG - Sistemas Cognitivos, SA); Mr PEREIRA, Ricardo (SISCOG - Sistemas Cognitivos, SA); Mrs PORTUGAL, Rita (SISCOG - Sistemas Cognitivos, SA); SALDANHA, Ricardo (SISCOG - Sistemas Cognitivos, SA)

Presenter: Mrs CARVALHO, Ana (SISCOG - Sistemas Cognitivos, SA)

Session Classification: Session 1.3 - Scheduling and transportation