Masterarbeit

Algorithmic scheduling of cleaning duties on trains in a preset timeframe

Operators of large train fleets require on optimal, close to real-time scheduling of cleaning duties in depots subjected to current operational circumstances. Particularly, the minimization of the sum of the completion times for each cleaning shift under the consideration of the minimization of the noise disturbance during the night is an urgent need by operators. A thorough investigation of the current situation of the cleaning process (from planning and tasks process to actors and resources) is conducted to clearly identify this scheduling problem. By means of a mixed-integer linear optimization model, this problem can be calculated on a daily basis with little temporal and financial effort.

The algorithm is divided into 3 main processes, regarding three different goals, namely to accomplish the assignment respecting the need of traffic contract, to minimize the unproductive time, and to minimize the noise disturbance.

Particularly, three objective functions are discussed in this thesis, including the maximum completion time, the total completion time and the total weighted completion time. A combination of maximum completion time and total weighted completion time are proven suitable for large parking yards with large numbers of railcars; while the function for total weighted completion time itself is applied in small ones, to attain a optimal result of sequence for cleaning process.

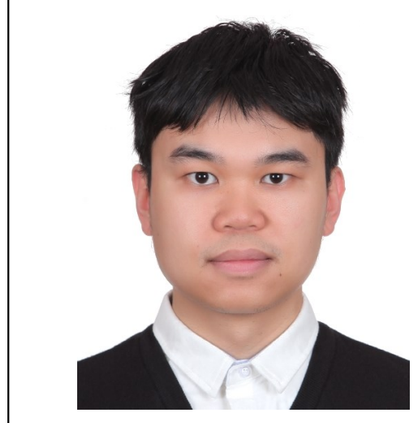
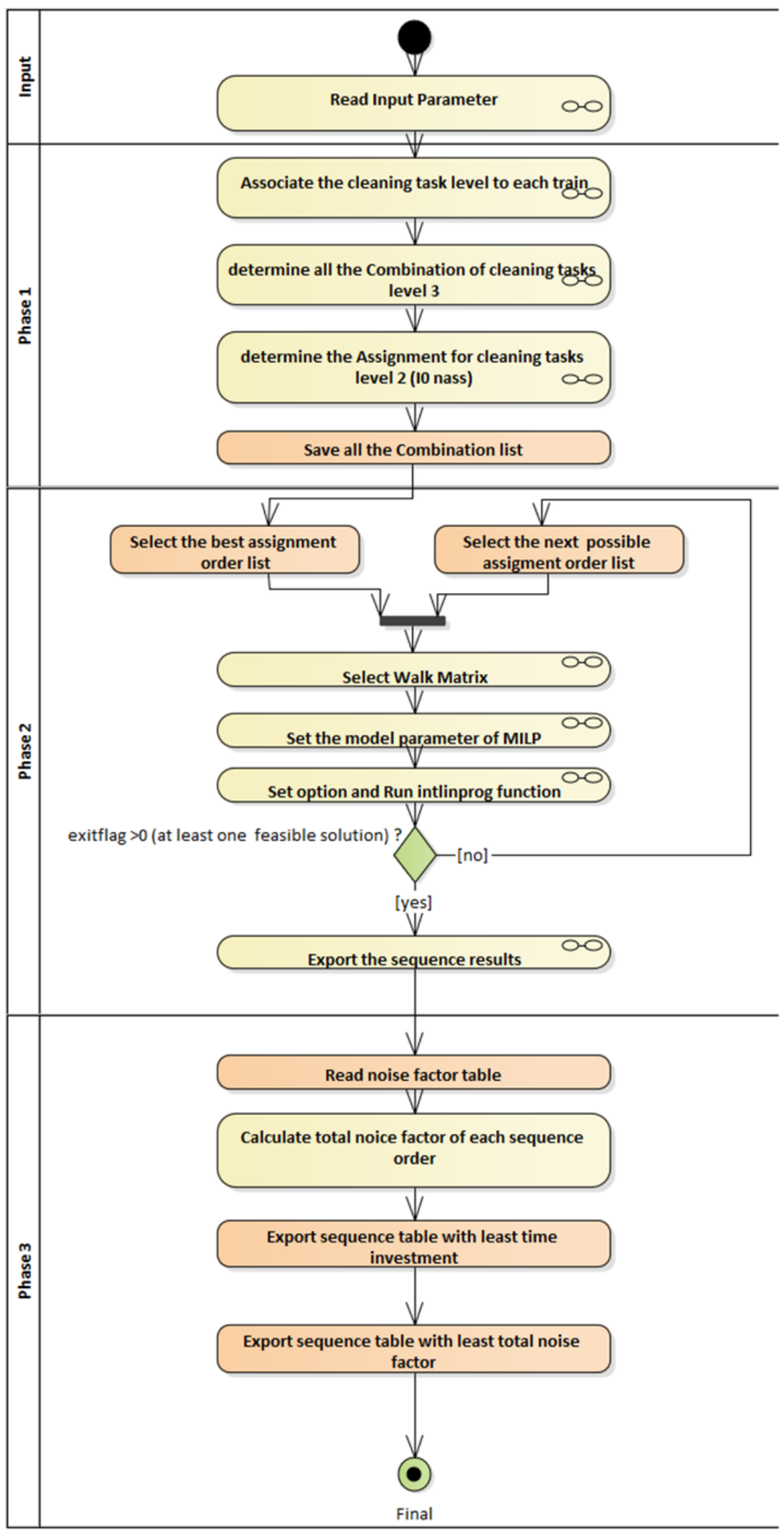
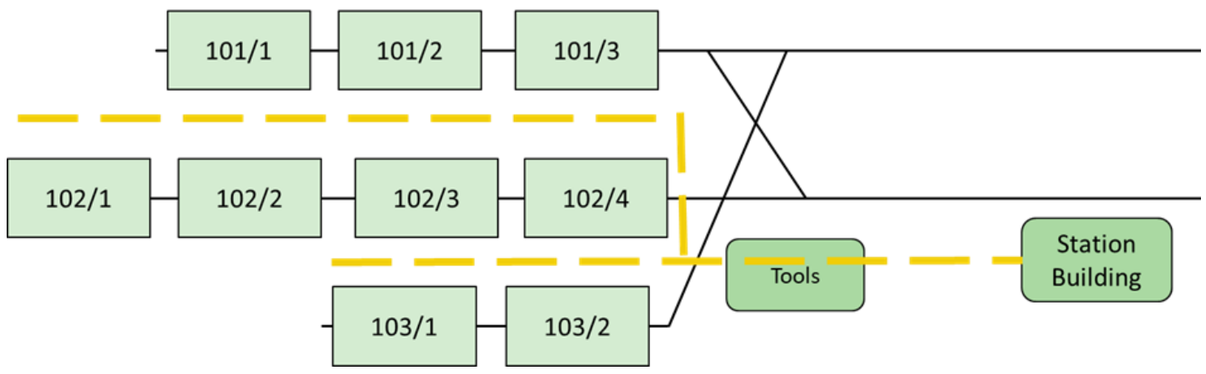
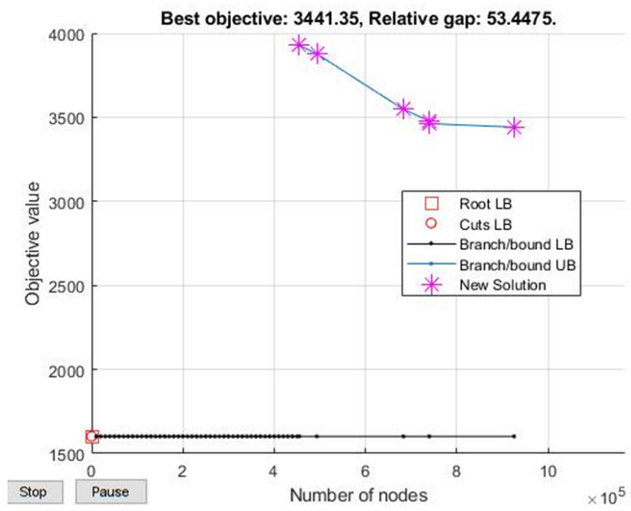
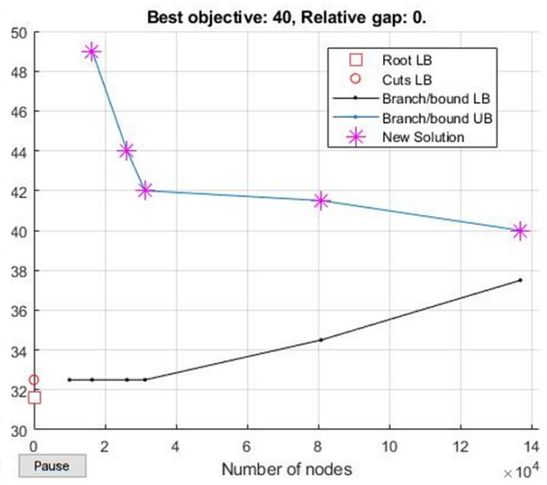


Foto: Zhixin Chen









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Aufzählung

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