

TITLE: PAINT MACHINE ASSIGNMENT PROBLEM

KEY WORDS OF ASSIGNMENT:

- ✓ Coating lines
- ✓ Algorithms
- ✓ Heuristics

SUMMER APPRENTICESHIP

MASTER THESIS

CONTENT OF ASSIGNMENT:

ArcelorMittal Gent is a steel plant situated in the port of Ghent. It produces flat steel products, used amongst others in the automotive industry. Starting from raw materials, the production process consists of a chain of treatments and manipulations, performed by different installations.

Decosteel is a finishing line, painting the coils using four layers (primer bottom/top, finish bottom/top). For each layer (except primer bottom) there are 2 painting installations available. Each installation needs to be cleaned before switching to another paint. It is possible to do the cleaning of one installation while the other one is in production. In this way, the setup time is reduced.



At this moment there is sequencing model used in the scheduling department. This model tries to find the best sequence of coils with the least setup time. The model uses a rule of thumb determining the assignment of the installations. This is based on transitions of 2 coils:

1. not a different paint -> keep the same installation.
2. if installation change is possible -> plan an installation change
3. if no installation change is possible -> change paint on the same installation

This rule of thumb does not always result in an optimal schedule.

In this master thesis, you go deeper into the machine assignment problem. You develop an algorithm or heuristic to find better solutions than those obtained applying the current rule of thumb. Furthermore, you can integrate your solution in the total sequence heuristic. The challenge is to find good solutions in a reasonable time.

You will get the opportunity to get hands-on experience in a state-of-the-art steel plant, work together with industry specialists in optimizing techniques and contribute to technological innovation.

OBJECTIVES:

- Study methods to solve installation assignment problems.
- Develop algorithm/heuristic to solve the installation assignment problems.
- Integrate this new solution into the existing full sequence.



EXPECTED COMPETENCES (KEY WORDS):

- ✓ Programming background (C++)
- ✓ Able to study algorithms/heuristics for scheduling problems.
- ✓ Language: English/Dutch

NUMBER OF STUDENTS:

- 1 or 2

TARGET GROUP : BACHELOR/MASTER/ ... & SPECIALISATION(S):

- Master of science in engineering (computer science, operations research, ...)

LOCATION:

- SYMO ArcelorMittal Gent, John Kennedylaan 51, 9042 Gent

PROMOTORS:

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- Academic :

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