1 - Scheduling Patients for Surgery
Chris Potts, Marion Penn, Paul Harper
Patients are referred to hospital for surgery and a scheduling policy determines the day of their operation. Emergencies must be treated immediately, while other patients have due dates that depend on their condition. Scheduling rules depend on whether the booking for a patient is immediate or can be delayed, the priority rule among patients to be booked, and the order in which potential booking dates are searched. Using data from a case study, we evaluate our scheduling rules using due dates being met; average patient waiting time; operating theatre overruns; and fairness to patients.

2 - Hot Strip Mill Scheduling under Consideration of Energy Consumption
Karen Puttkammer, Matthias Gerhard Wichmann, Thomas Spengler
In steel industry hot rolling is an energy intensive process as steel slabs need to be heated before being rolled on the hot strip mill. The energy consumption is determined by the production schedule. Due to rising energy prices decision support for the hot strip mill scheduling problem (HSMSP) under consideration of energy consumption becomes necessary. This contribution is based on a new MILP formulation. Therein the energy requirement for heating is modeled according to causation. We propose a problem specific heuristic solution approach and present first numerical results.

3 - Reception, Mixture and Delivery of Crude Oil in a Terminal
Bernardo Zinbarg, Eduardo Camponogara, Enrique Ferreira
This paper refers to the reception, mixture and delivery of crude oil. Each tank at the terminal receives different qualities from different cargos that arrive in predefined periods. Transfer is allowed between tanks and the main pipeline to the refinery. There is a schedule of crude oil delivery that consists of finding an optimized schedule that meets the constraints. An MILP model is proposed, analyzed, and solved for a specific case. The tool can be applied to determine the optimal schedule of crude oil operations over a time horizon.

4 - Optimal Scheduling for Storage and Retrieval of Assembly Blocks in Temporary Storage Yard for Shipbuilding Process
Byung-Hyun Ha, Jung-Ryoul Son
This paper studies scheduling of storing and retrieving assembly blocks in a temporary storage yard for shipbuilding process. The objective is to minimize the number of relocations of blocks subject to the storage and retrieval time windows being satisfied. We show the problem is NP-hard and present a mixed-integer programming model based on multi-commodity network flows. The revised models are proposed by investigating the properties in the problem. To overcome the computational inefficiency, an A* algorithm is devised and the performance is validated through the numerical experiments.

Scheduling Applications 2
Stream: Scheduling
Invited session
Chair: Greet Vanden Berghe

1 - Some Finite Planning Horizon Inspection Models with Non-Negligible Inspection Times
Honest Chipoyera
Finite planning horizon Inspection models with non-negligible inspection times are developed for a system whose time to failure has a known probability distribution. Two scenarios are explored: 1) inspections take place while the system is running, 2) whenever the system has to be checked, it is switched off completely. For these two scenarios, the sub-scenarios each are studied: a) all inspections are of the same fixed duration and b) inspection times are random variables following a known probability distribution. Maximization of profit is used as the sole optimization criterion.