Decison-Aid Methodologies in Transportation

Optimization Exercise 5

Transport and Mobility Laboratory
EPFL

May 20, 2014

Quay Crane Scheduling Problem

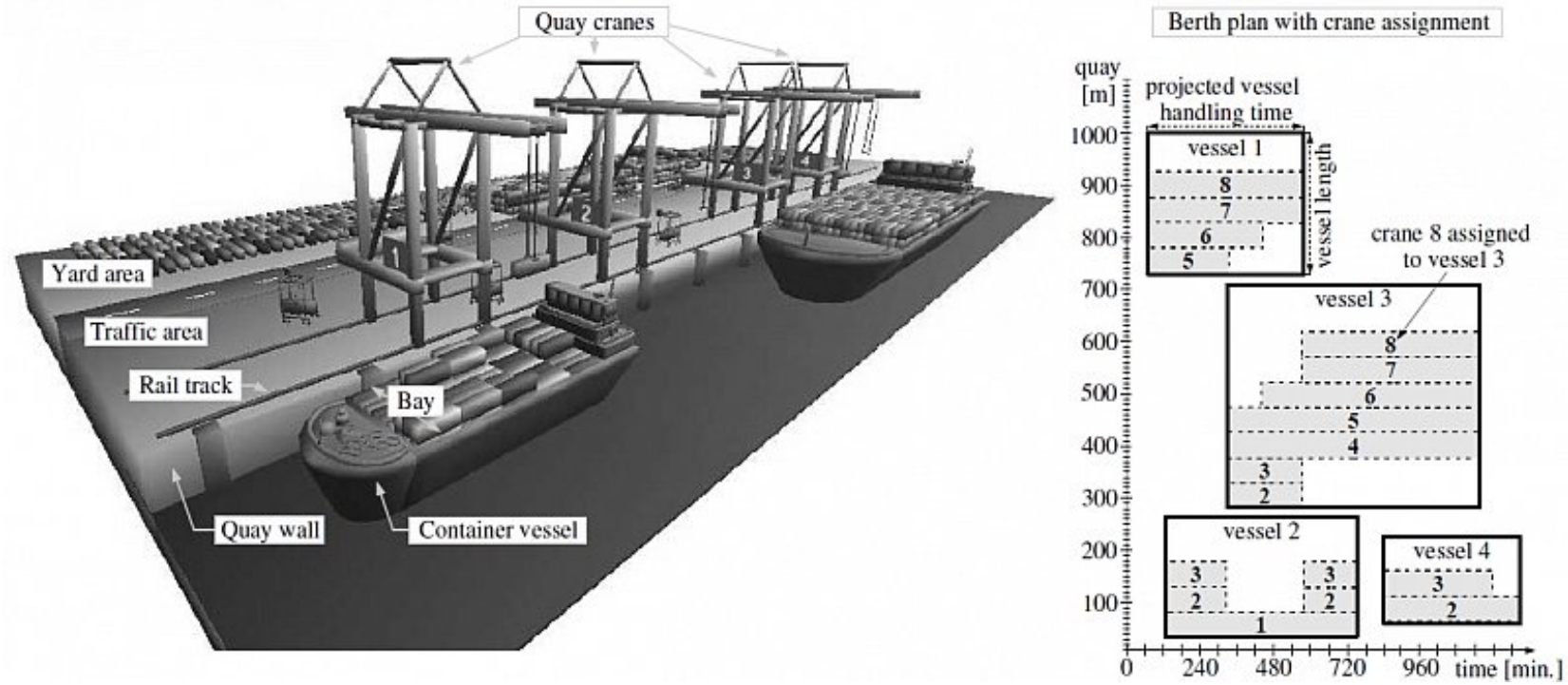

Figure: source:
http://prodlog.wiwi.uni-halle.de/forschung/container/?lang=en

What it looks like

- `http://www.youtube.com/watch?v=a1clxIUzwBY`
- `http://www.youtube.com/watch?v=xWTZTwL-hzY`
- `http://www.youtube.com/watch?v=INsf6XHdfAA`

Model

- presented in the lecture
- minimize the handling time of the vessels
- constraints to cover:
  - handling of the vessel is finished, when all the cranes finished their work
  - time it takes to complete a bay
  - a bay is handled exactly by one crane
  - a bay is completed in one run, *i.e.* the crane is not allowed to complete half of a bay, work on another bay and then come back to complete it
  - overtaking of cranes not allowed (rail)
  - overtaking of inactive cranes
  - the first and the last crane, can not be pushed out of the rail

- you need to solve several instances
- some are more difficult to solve than the others, hence following time limit is set (10 min):
- ```
  execute
  {
          cplex.tilim = 600;
  }
  ```
  ```

References

Yan Wang and Kap Hwan Kim, *A quay crane scheduling algorithm considering the workload of yard cranes in a container yard*, J. Intell. Manuf. **22** (2011), no. 3, 459–470.