

Speaker: David Pisinger

Title: "Network Design in Liner Shipping"

The shipping industry is responsible for around 2.2% of the CO₂ emission in the world, and a substantial part of the NO_x and SO_x emission.

Decreasing freight rates and tight regulations for emission makes it difficult to operate liner shipping economically viable. It is therefore necessary to frequently redesign the network to meet customer demands while minimizing the operational costs.

Given a fleet of container vessels and a set of demands to transport, the liner shipping network design problem asks to design a set of scheduled routes, deploy vessels of appropriate size to the routes and decide the speed on each leg, such that all demands can be transported within some pre-defined time-limits.

Real-life instances may involve 20.000 demands and 500 vessels, pushing the limits of solvers.

In this talk we give an overview of recent solution methods, spanning from branch-and-cut methods, to matheuristics and backbone-based methods. Results from the LINER-LIB benchmark suite will be reported. In the end of the presentation, some parallels will be drawn to the related line planning problem in public transportation.