

## **#27 Topic: Multi-layer dynamics in the Dutch railway network**

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### **Abstract:**

Disruptions in the railway system are a typical example of how individual local problems can lead to nation-wide problems. Using data of the Dutch line, rolling stock and crew schedules as provided in a collaboration with the Dutch Railways (NS) and ProRail, we look at how this so-called 'delay propagation' works and how a view of the system as a multi-layered network can help minimise this phenomenon. We define a model, from which we identify three vulnerability metrics to pinpoint weaknesses in the network and try to mimic the potential evolution of a large-scale disruption.