Real-time railway network traffic monitoring systems

Problem description

The increase in traffic intensity and complexity of the railway system demands new advanced Traffic Management System (TMS) for improved real-time traffic control. Railway networks are highly interconnected and interdependent and train delays and, as in vehicular traffic networks, disruptions experienced in one part of the network could propagate and affect the traffic much further away. Traffic controllers need to take right dispatching decisions to minimize the negative effect of delays and disruptions. In order to support controllers with correct information, it is critical to accurately monitor the current and efficiently predict the future traffic state. It is particularly important to have a holistic view of the system performance, i.e. to be able to understand the behaviour of the whole network, in order to make the best control decisions.

Assignment

- Review and analyse current traffic monitoring systems in different transport modes, e.g. coming from road, air and water traffic
- Determine the needs for new advanced traffic monitoring and prediction systems
- Investigate the link between the microscopic and macroscopic features of railway traffic at the network level
- Develop new real-time railway traffic monitoring system based on new and/or extending existing concepts from other transport modes
- Develop new railway traffic state prediction model to accurately predict delays in the network
- Write a report and a scientific paper

Information

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