Scientific head:	Prof. Dr. F. Corman
Project title:	**Descriptive dynamics of online workforce scheduling problem**
Supervision:	Matej Jusup

Background

Workforce scheduling pertains the assignment of mobile resources (people, customer care, machines) which are dispatched on a very short notice to repair or deal with problems in services. Examples are repairs or upgrading to home telephone systems, assistance to failed cars, etc. the requests come with a certain time pattern (when they are raised) degree of urgency (when they need to be fixed), expected length (duration it will take to solve them) and geographic dispersion (where they happen to be). All those three characteristics impact the quality and solution approach to find an optimal assignment of resources to solve them.

Problem description

The workforce scheduling is an inherently dynamic problem, i.e. requests arrive continuously, which need to be assigned a time slot. The speed with which requests arrive, determines the dynamics of the system. In case of very fast dynamics, with many requests arriving within few minutes, only very fast approaches for scheduling workforce are acceptable, as a reaction to each new request. This project wants to study the space and time dynamics of the requests, by descriptive tools (aggregation in time, survival analysis, spatial regression).

Research question

How can the dynamic of an online workforce scheduling system be determined (i.e. the degree by which the constraints of the problems change over time, as new requests arrive)? Which influential time and geographic patterns can be identified?

Expected results

- Study literature on online problems queuing systems
- From past logs of requests, determine some metric of dynamics, which would give enough evidence for supporting decision making, for what pertains predictability of requests (amount of request in space and time); predictability of the characteristics of the request (length, urgency), and descriptive analysis of those factors.

Extra:	This project would be carried out in cooperation with a private company operating in the business of workforce scheduling, providing instances and know how.
Credits:	
Requirements:	