

Capita Selecta Emergency Service Logistics

Date:	25 September & 16 October 2019
Time:	10.00 – 16.00 h.
Location:	Utrecht
Course leaders:	Prof. dr. R.D. van der Mei (CWI/VU) and Dr. P.L. van den Berg (EUR)
Days:	2
ECTS:	0,5 (participating only) - 2 participating + assignment
Course fee:	Free for TRAIL/Beta/OML members, others please contact the TRAIL office
Registration:	www.gpoml.nl

Objectives

The students will learn:

1. What is the state-of-the-art in models and methods for determining strategic locations of resources urgently needed in emergency situations?
2. What is the state-of-the-art in models and methods for real-time operational planning of resources in emergency situations (dispatching, relocations).
3. How these models and methods are used in real-life practice.

Course description

In life-threatening emergency situations where every second counts, the timely presence of medical aid can make the difference between survival or death. In other emergency situations like machine breakdowns (of for example medical equipment), the timely presence of repairman not only saves cost but may also save lives. This raises the need for the development of models and methods to make sure that in emergency situation required resources are at the right time at the right place. Motivated by this, in the course the focus will be on developing and analyzing models for optimal resource planning, both at the strategic and at the operational level.

Assignment

The students will get a homework assignment in which the theory discussed during the course can be used to solve real-time emergency problems.

Program

Day 1:

- General introduction
- Models for strategic planning (location models)
- Models for operational planning (real-time dispatching and proactive relocation)
- Planning high- and low-emergency calls

Day 2:

- Planning relocation of firetrucks for large-scale fire incidents
- Application of the relocation and dispatching and models in different application areas (railway, taxi planning, predictive maintenance)
- Emergency planning, from theory to practice: do's and don'ts, lessons learned
- Emergency planning in real-life practice

Course material

1. Presentation slides
2. Background reading: several relevant papers will be discussed during the course

Prerequisite

The students should have a basic understanding of operations research, including stochastic and deterministic optimization problems.

Reading material

To prepare for the course, the following papers are interesting:

1. C.J. Jagtenberg, S. Bhulai and R.D. van der Mei (2016). An efficient heuristic for real-time ambulance redeployment. *Operations Research for Health Care* 4, 27-35.
2. P.L. van den Berg, G.A.G. Legemaate and R.D. van der Mei (2017). Boosting the response-time performance of firefighter services by Mathematical Programming. *Interfaces* 47, 352-361.