UNIVERSITY OF PASSAU
Faculty of Business Administration and Economics

A cordial invitation to the first talk of the
Brown Bag Seminar
*Recent Developments in Data Science*:

# Duty Rostering for Physicians via Integer Programming: A Web-Based System and its Practical Application

By
Prof. Dr. Clemens Thielen

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| Date: | 13.05.2022 (Friday) 10:30 – 12:00 |
| Location: | (WIWI) HS 6 |
| Link and further information: | Course 39740 Seminar: Doctoral Seminar "Recent Developments in Data Science" in Stud.IP |

https://www.wiwi.uni-passau.de/forschung/brown-bag-seminar-rdds/

**Abstract:**

Duty rostering for nurses and physicians is an important task within personnel planning in hospitals and has a large impact both on the efficient operation of the hospital and on employee satisfaction. Good rosters should not only satisfy many complex constraints resulting, e.g., from minimum rest times or required staffing levels, but at the same time achieve a fair distribution of the workload and adhere to the preferences of the planned personnel. This talk presents a web-based duty rostering system for physicians that is used in practice in two different departments of two German hospitals. The system consists of custom-built integer-programming-based optimization models for duty roster generation and a web interface that is used to collect all necessary input data such as each physician's preferences concerning each possible duty assignment on each day of the planning period. Besides the structure of the duty rostering problems faced in the two departments, we present how fairness and physician preferences are incorporated and we demonstrate how the physicians' preferences are elicited via the web interface. Moreover, we analyze the computed rosters and present long-term results about their quality.

**Speaker:**

Prof Dr. Clemens Thielen

Clemens Thielen studied mathematics at the Technical University of Kaiserslautern and the University of Cambridge (UK). After his PhD at the intersection of discrete optimization and algorithmic game theory, he worked as a junior professor within the Department of Mathematics of the Technical University of Kaiserslautern. Since October 2019, he is Professor of Complex Networks at the TUM Campus Straubing for Biotechnology and Sustainability.

His research focuses on efficient optimization methods and their application to problems from different areas of application. A particular focus is on modeling and solving optimization problems on networks as well as on efficient algorithms for optimization problems with multiple objective functions. Practical applications of his research include duty rostering for physicians in hospitals and the development of sustainable solutions for municipal heavy rain risk management..