V**OR** träge zum Operations Research

Kolloquium des Instituts für Operations Research

Zeit:	Mittwoch, 13. November, 15:45 Uhr
Ort:	**Raum 320, Gebäude 09.21**
Es spricht:	Prof. Dr. Alain Zemkoho, University of Southampton, UK
Zum Thema:	The bilevel optimization renaissance through machine learning: Leesons and challenges

Bilevel optimization has been part of machine learning for over 4 decades now, although perhaps not always in an obvious way. The interconnection between the two topics started appearing more clearly in publications since about 20 years now, and in the last 10 years, the number of machine learning applications of bilevel optimization has literally exploded. This rise of bilevel optimization in machine learning has been highly positive, as it has come with many innovations in the theoretical and numerical perspectives in understanding and solving the problem, especially with the rebirth of the implicit function approach, which seemed to have been abandoned at some point. Overall, machine learning has set the bar very high for the whole field of bilevel optimization with regards to the development of numerical methods and the associated convergence theory for algorithms, as well as the introduction of efficient tools to speed up components such as derivative calculations among other things. However, it remains unclear how the techniques from the machine learning literature can be extended to other applications of bilevel programming. For instance, many machine learning loss functions and the special problem structures enable the fulfilment of some qualification conditions that will fail for multiple other applications of bilevel optimization. We will start this talk with the definition of a bilevel optimization and some applications in economics. we will then provide an overview of machine learning applications of bilevel optimization, while giving a flavor of corresponding solution algorithms and their limitations. Subsequently, we will discuss possible paths for algorithms that can tackle more complicated machine learning applications of bilevel optimization, while also highlighting lessons that can be learned for more general bilevel programs.

Die Vorträge zum Operations Research wenden sich an alle Interessierten!

Bei Rückfragen wenden Sie sich bitte an:

Prof. Dr. Oliver Stein, Institut für Operations Research