SWZ Clausthal – Göttingen
Simulationswissenschaftliches Zentrum

Invitation to lecture series
„Simulation Sciences“

Wednesday, May 6th 2015, Room 0.101, Institute for Computer Science, University of Göttingen, 3:30 pm

Dr. Sebastian Stiller
Institut für Mathematik,
Technische Universität Berlin

will talk about

How to order a waiting list?

Content of the lecture:

How to order the waiting list for an overbooked flight? This amounts to the problem of packing a knapsack without knowing its capacity. Whenever we attempt to pack an item that does not fit, the item is discarded; if the item fits, we have to include it in the packing. We show that there is always a policy that packs a value within factor 2 of the optimum packing, irrespective of the actual capacity. If all items have unit density, we achieve a factor equal to the golden ratio R = 1.618. Both factors are shown to be best possible. In fact, we obtain the above factors using packing policies that are universal in the sense that they fix a particular order of the items and try to pack the items in this order, independent of the observations made while packing. We give efficient algorithms computing these policies. On the other hand, we show that, for any R > 1, the problem of deciding whether a given universal policy achieves a factor of R is coNP-complete. If R is part of the input, the same problem is shown to be coNP-complete for items with unit densities. Finally, we show that it is coNP-hard to decide, for given R, whether a set of items admits a universal policy with factor R, even if all items have unit densities. This is joint work with Yann Disser, Max Klimm, and Nicole Megow.

Guests are welcome.

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The SWZ is a common interdisciplinary research facility in simulation science of

TU Clausthal

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

The lecture will be held in this building:

Room 0.101
Institute für Computer Science, University of Göttingen
Goldschmidtstrasse 7
37077 Göttingen