

VOR träge zum Operations Research

Kolloquium des Instituts für Operations Research

<i>Zeit:</i>	Mittwoch, 05. Juli 2023, 11:00 – 12:00 Uhr
<i>Ort:</i>	Raum 4A-09, Gebäude 05.20
<i>Es spricht:</i>	Thomas Byrne, PhD
<i>Zum Thema:</i>	Getting Over It: exact facility location algorithms in the presence of barriers

The problem of finding optimal locations for a set of service facilities is of strategic importance and so, with good reason, an increasing number of models and algorithms are appearing in the literature. Nevertheless, an appropriate measure of distance is ordinarily neglected. In current research, distance is often assumed to be Euclidean (as the crow flies), but in many applications this is far from sensible. Particularly when we look at urban applications of facility location, taking into account the grid structure prevalent in many cities' road structures, the distance between two points resembles the Manhattan (or block/rectilinear) distance. Further problems occur when we introduce areas that cannot be traversed (for example, barriers) since then we can no longer use straightforward distances and must instead use geodesic distances.

One special type of barrier for concerted focus is a river. Large population densities congregate around large rivers. While humans inhabit around 38% of the world's surface area, humans inhabit over 40% of the area for which a river is the closest water feature. In fact, on average, the closest body of water to a human is a large river at a median distance of 2.2km.

However, in current facility location models, the pivotal influence on travel that a river exerts has not yet been adequately addressed. Despite providing such vital resources to a settlement to this day, rivers are usually impassable but for pre-constructed crossings and so present a very real barrier to anyone hoping to travel besides or to the other side of the river.

In this talk we will explore two different exact approaches to common facility location problems with Manhattan distances, considering both continuous and discrete demand, and polygonal and line barriers. These algorithms exploit the unique and interesting geometrical properties of such problems. In this way, when presented with a barrier in our location problems, we can truly get over it.

Die Vorträge zum Operations Research wenden sich an alle Interessierten!

Bei Rückfragen wenden Sie sich bitte an:

Prof. Dr. Stefan Nickel, Institut für Operations Research