**Master thesis**

# Facility Layout

The Facility Layout Problem is concerned with fitting a number of rectangular shaped departments into a rectangular facility with the objective to maximize the total benefits associated with the interactions between these departments (for example transportation synergies, or adjacency preferences). None of the departments may overlap in the resulting layout of the facility.

More specifically, you are given a number $n$ of rectangular departments $d_1, \ldots, d_n$. All $n$ departments have a length $l_i$ and a width $w_i$ ($i = 1, \ldots, n$). For every pair of distinct departments $i$ and $j$ there is a coefficient $c_{ij}$ denoting the total benefits obtained when departments $i$ and $j$ share a non-zero length border. Furthermore, you are given the dimensions ($L$ and $W$) of a large, rectangular facility. The problem now is to find an assignment of all $n$ departments to a location in the facility, such that no departments overlap and the total obtained benefit is maximized.

In the thesis you should address the following points (notice that the structure of the thesis need not follow the sequence of the points listed below):

- Give a description of the problem.

- In what types of industries or environments is this problem relevant?

- What variants of the problem can you distinguish?

- Make sure that appropriate academic literature is mentioned.

- Give a mathematical programming formulation of the problem.

- Identify and describe solution methods.

For more information please get in contact with Dr. Bart Vangerven (https://www.prodlog.uni-wuppertal.de/index.php?id=6481).

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