

# Space Optimization

## Spatial Re-Configuration through Mathematical Optimization

### Background and aim:

The spatial configuration of a building can be abstracted as a network of functional spaces that influences the functionality of a building in terms of movements of the occupants, logistic efficiency, feasibility of social distancing, safety of routing, and security. The aim of the research is to propose a systematic way of configuring buildings in 3D to optimally meet functional requirements pertaining to such factors etc.

### Research question:

How to optimize the allocation of spaces in a building based on a program of requirements, and a set of criteria concerning accessibility and visibility?

### Design objective:

To design and implement a computational 3D layout methodology.

### Methods:

- Operations Research (Mathematical Optimization)
- Quadratic Assignment Problem
- Computational Topology and Graph Theory
- Computer Programming (Python/C#)

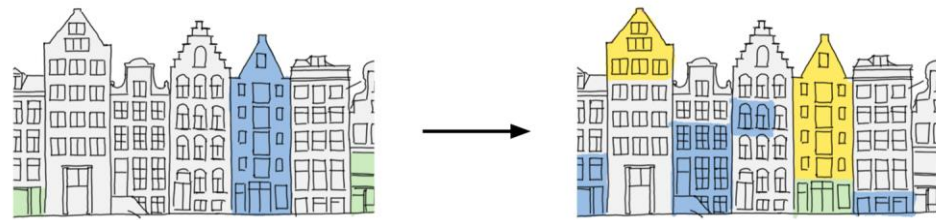


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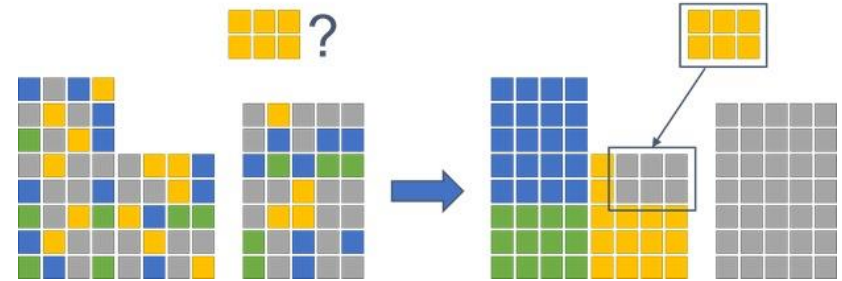


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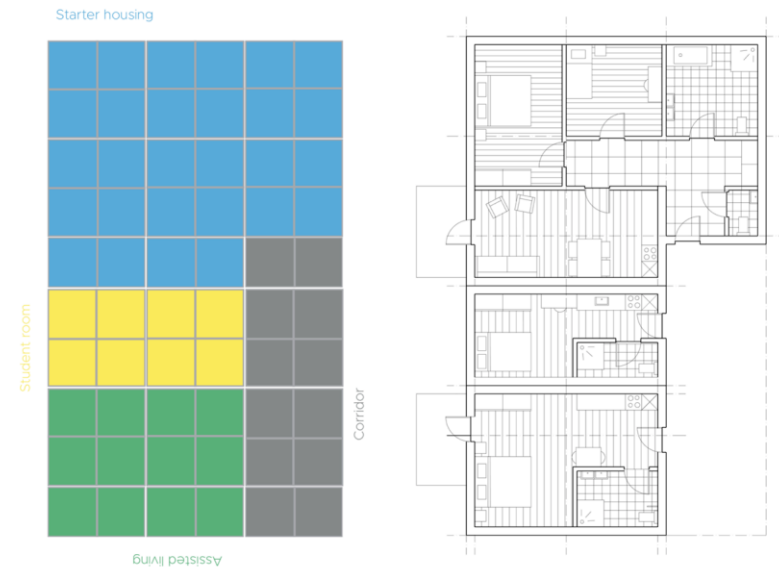


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