Multi-objective mixed-integer evolutionary algorithms for building spatial design
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Propositions
accompanying the thesis

Multi-Objective Mixed-Integer Evolutionary Algorithms for Building Spatial Design

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1. Understanding the representation of the design space is key to the development of effective algorithms to explore it [Chapter 3]

2. In optimisation problems with constraints, knowledge about the problem at hand leads to powerful constraint handling techniques [Chapter 5]

3. Being able to explain the optimisation results to the human designer in a domain specific language is as important as obtaining the optimisation results [Chapter 7]

4. Mixed-integer evolution strategies can be generalised to multi-objective problems to provide a good method to simultaneously optimise continuous, integer, and nominal discrete variables [Chapter 8]

5. In multi-objective optimisation there is typically no single best solution, but there are many that are clearly not optimal

6. How to compare sets of non-dominated points remains a difficult topic in multi-objective optimisation, and should not be done based on any single metric

7. The Pareto order is useful in multi-objective decision analysis, but is not sufficient to distinguish between solutions when a large number of objectives is considered

8. The decision maker should not be replaced by the optimisation algorithm but should be central to and actively included in the entire process

9. Seek help, seek to help, everyone needs and deserves it