Mixed-integer evolution strategies for parameter optimization and their applications to medical image analysis

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Propositions (Stellingen)

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Mixed-Integer Evolution Strategies for Parameter Optimization and Their Applications to Medical Image Analysis

1. Most classical *divide-and-conquer* based techniques have difficulty in dealing with the *black-box* mixed-integer parameter optimization problems.
2. Mixed-integer evolution strategies, a special variant of an evolution strategies, is particularly suitable for *black-box* mixed-integer parameter optimization in high-dimensional spaces. [This thesis]
3. Mixed-integer NK Landscapes extends the standard NK landscape model from the binary case to the mixed-integer problem domain, and it is a suitable test model for our proposed mixed-integer evolutionary algorithms. [This thesis]
4. Feature detection in medical images is a key task in the medical field. Learning the optimal parameter settings of a feature detector for different interpretation contexts is an optimization problem which is very difficult to solve in practice. [This thesis]
5. Mixed-integer evolution strategies is a promising method for the optimization of control parameters of a state-of-the-art multi-agent based image analysis system. [This thesis]
6. Introduction of fitness based partitioning does produce sets of parameter settings which lead to better lumen segmentations when compared to one "*super optimal*" solution for all images. [This thesis]
7. Assisted by radial basis function networks, mixed-integer evolution strategies is more efficient for optimization with time consuming evaluation functions. In mixed-integer space, the enhanced heterogeneous distance measure is suitable for implementing this approach. [This thesis]
8. By using niching methods, Mixed-Integer Evolution Strategies can more reliably obtain the global optimum in highly multimodal search landscapes. [This thesis]
9. The proposed mixed-integer Bayesian optimization algorithm can effectively explore a-priori knowledge about correlation between parameters. [This thesis]
10. Traveling in the Netherlands, you need only one ticket: a strong umbrella.