# Optimization Techniques

## Laboratory 8

### Multi-Objective Optimization

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# Multi-Objective Optimization

Non-independent objectives

- choosing a job: work-life balance vs impact
  salary vs location
- machine learning: interpretability vs capability

Conventional approaches

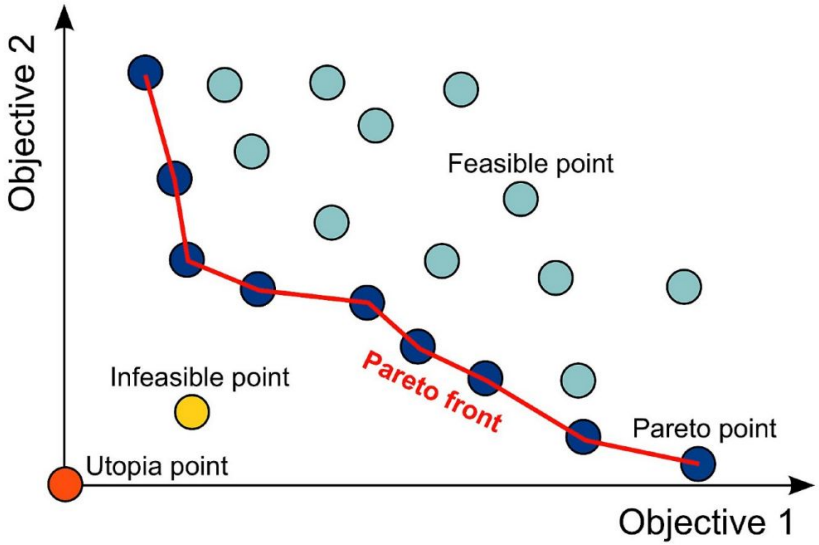
- weighted sum of the objectives
- objective ordering
- *k* single-objective constrained problems

Pareto Front

- not Pareto-dominated solutions

no worse on all objectives

better on at least on objective



# Non-Dominated Sorting Algorithm-II

Genetic operators (mutation and crossover) are the same as for single-objective cases

Selection (w. elitism) is composed of two parts:

- Pareto rank based on non-dominated sorting
- Crowding-distance sorting to prefer “isolated” solutions to better represent the Pareto front