On Using Populations of Sets in Multiobjective Optimization

**Set-based Optimization**

**Recombination**

Different ways to do mating and environmental selection:

- **Variant A1**
  - randomly select \( \mu \) pairs
  - replace all

- **Variant A2**
  - generate all \( \mu (\mu - 1) \) pairs
  - select \( \mu \) best

- **Variant B1**
  - select one set, merge the rest
  - duplicate \( \mu \) times

- **Variant B2**
  - for all \( \mu \) sets recombine with union of remaining sets

**Application**

- **WOFG 2d**
  - solutions, Pareto front and area exclusively dominated by ...
  - standard MOEA
  - variant A1

- **WOFG 4d**

**Running time**

- **WOFG 2d**
  - objective function evaluations

**Comparison**

- **WOFG 3d**
  - solutions, Pareto front and area exclusively dominated by ...
  - standard MOEA
  - variant A1

**Open Questions:**

- What are good operators on sets?
- Is a population of sets beneficial over a hillclimber?