EA Performance Prediction and Problem Specific Knowledge

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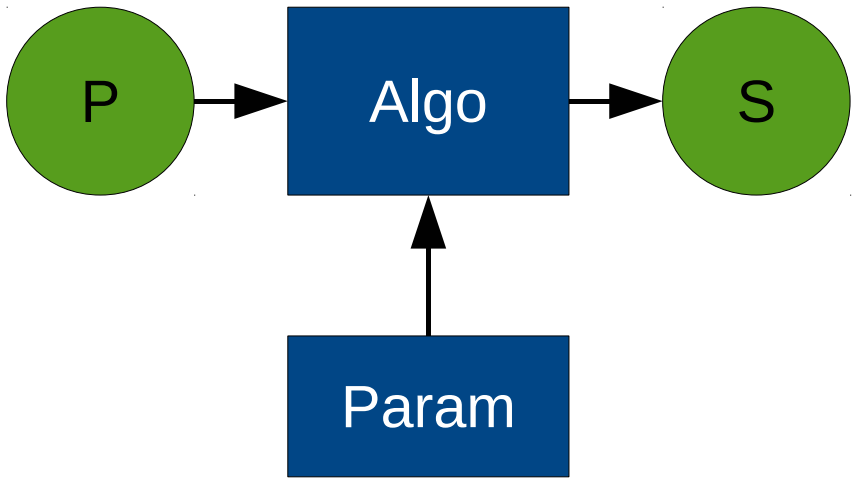
Outline

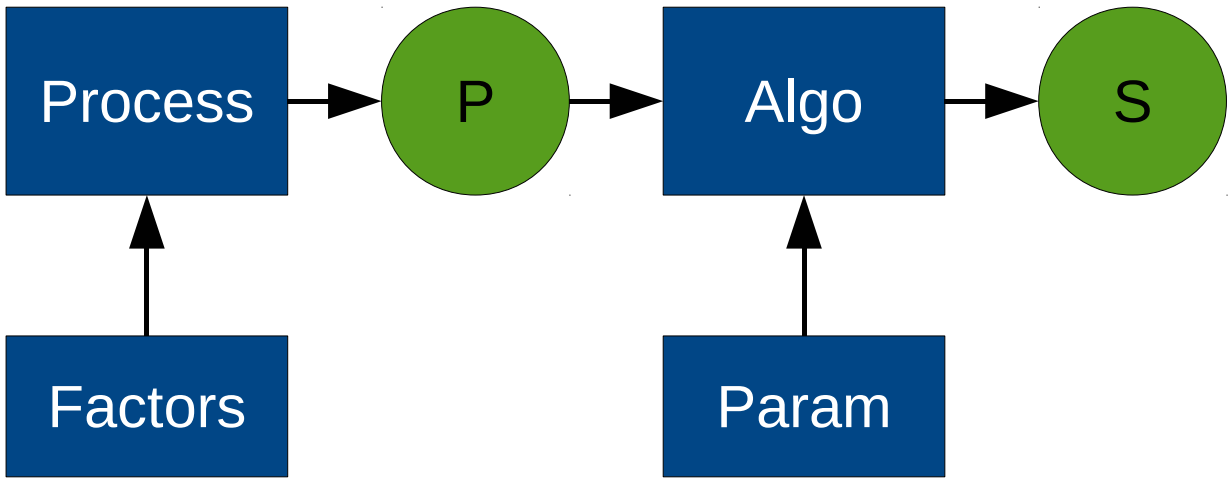
Motivation

- EA performance is empirical
- Observed performance needs to be generalized
- No Free Lunch
- Requires characterization of the instances

Big picture



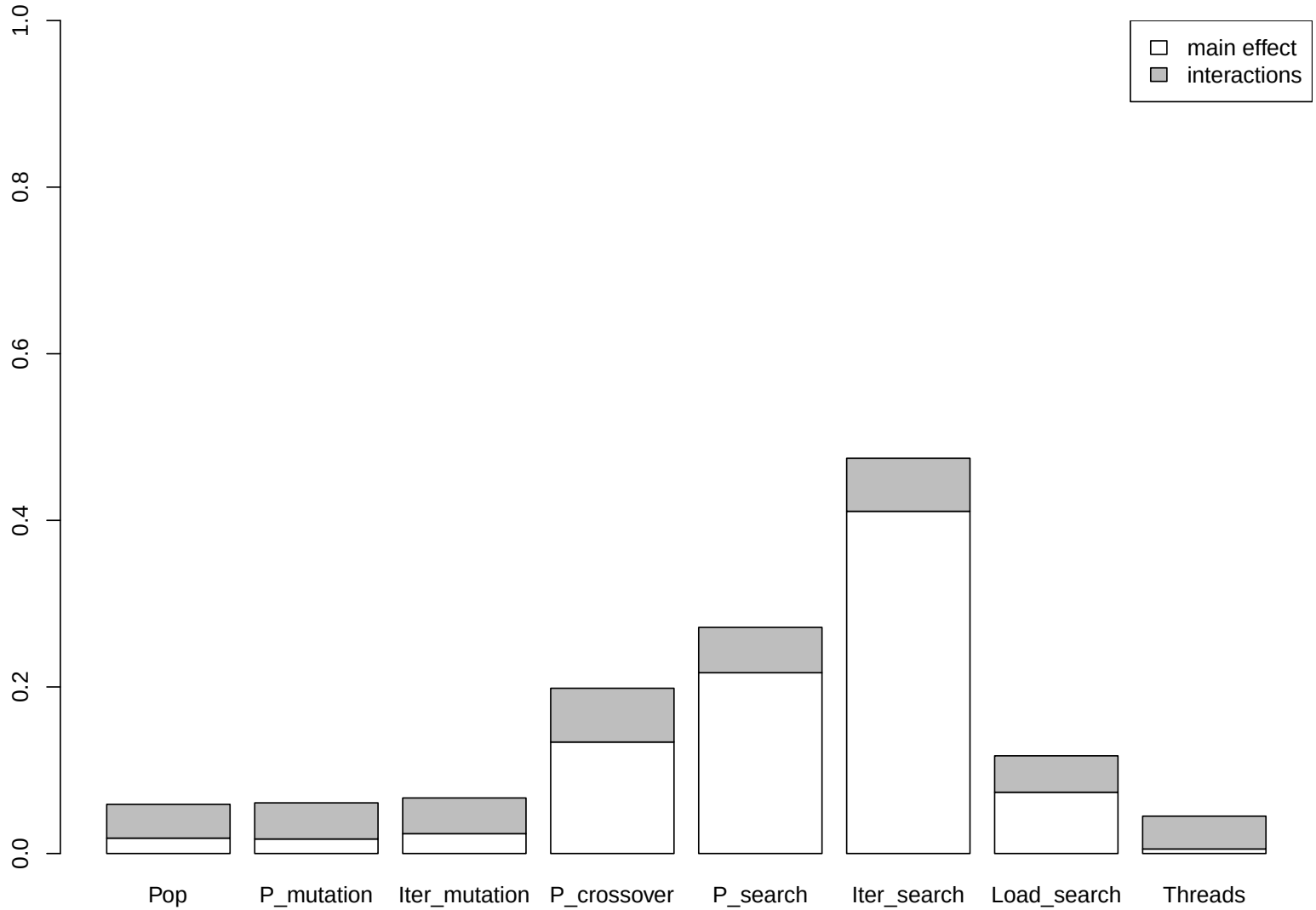
Instance generation



Sensitivity analysis

- Quantitative
- Applies to all models
- How uncertainty in parameters affect uncertainty in output

Example Analysis

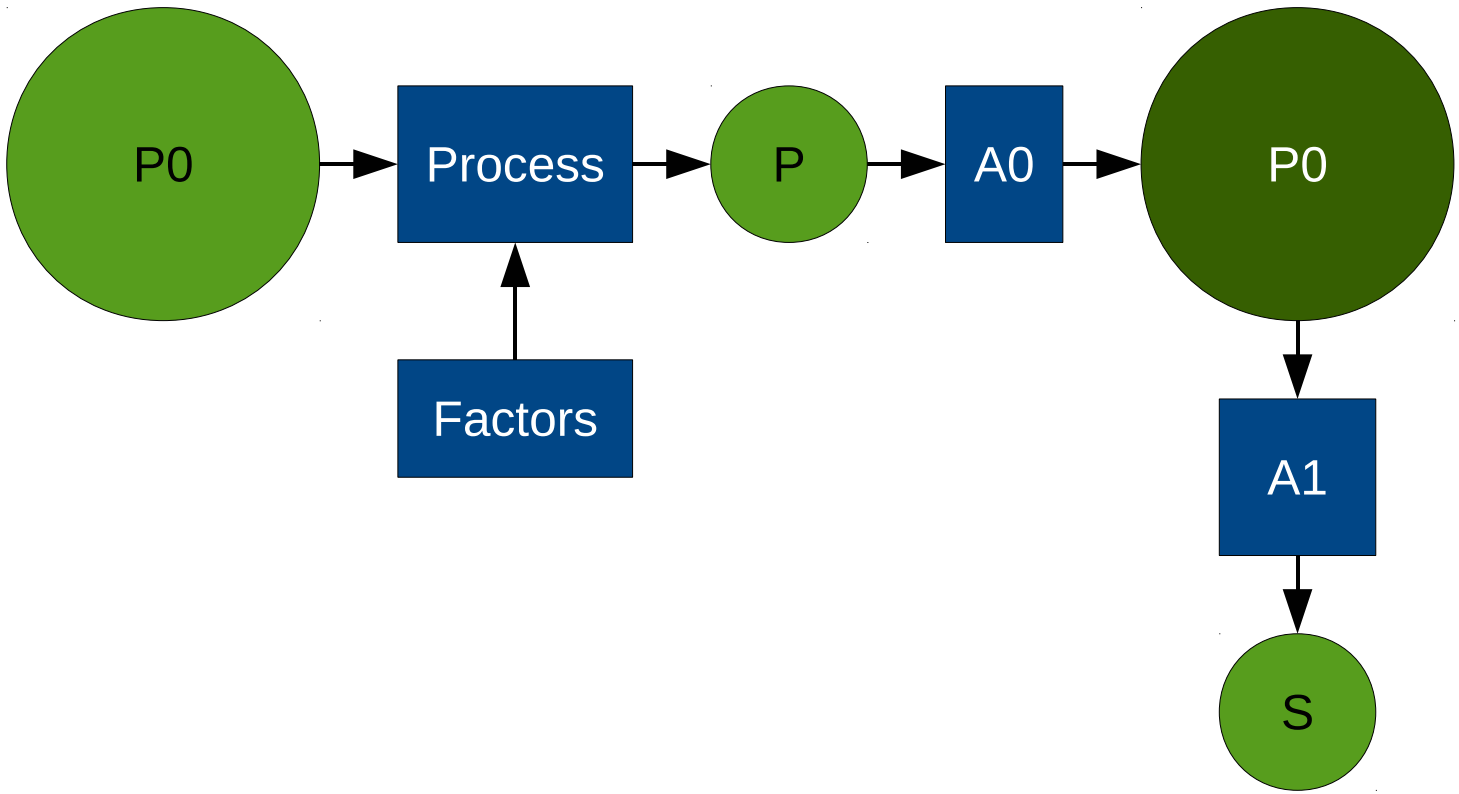


Approach

- Given a reference instance on which EA provides good results
- Given SA results for factors of the instance generator
- Provides a set of instances on which EA offers good results:
  - parameters with little or no influence can take any value
  - parameters with influence can only take values of reference instance

Incomplete information

- The instance does not represent the problem
- Rediscover the original problem
- Search with partial view of the problem
- Stochastic environment



Conclusion

- No Free Lunch
- Hobbits :)