Sparkle Algorithm Portfolio report

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1 Introduction

Sparkle [2] is a multi-agent problem-solving platform based on Programming by Optimisation (PbO) [1], and would provide a number of effective algorithm optimisation techniques (such as automated algorithm configuration, portfolio-based algorithm selection, etc.) to accelerate the existing solvers.

2 Parallel Portfolio runtime_experiment

In this scenario, Sparkle runs the portfolio of Solvers on each instance in parallel with 2 different seeds. The cutoff time for each solver run is set to 60 seconds.

2.1 Solvers & Instance Sets

The following Solvers were used in the portfolio:

- **Solvers/CSCCSat** (1 configurations)
- **Solvers/MiniSAT** (1 configurations)
- **Solvers/PbO-CCSAT-Generic** (1 configurations)

The following Instance Sets were used in the portfolio:

- **PTN** (12 instances)

2.2 Portfolio Performance

The objective for the portfolio is PAR10. The following performance of the solvers was found over the instances:

- **Solvers/CSCCSat** was the best solver on 9 instance(s).
- **Solvers/MiniSAT** was the best solver on 0 instance(s).
- **Solvers/PbO-CCSAT-Generic** was the best solver on 3 instance(s).

Table 1 shows the performance of the portfolio on the test set(s).

Figure 1 shows the emprical comparison between the portfolio and the single best solver (SBS) CSCCSat.

Solver	PAR10	# Timeouts	# Cancelled	# Best
Solvers/CSCCSat	350.8879	2	7	9
Solvers/MiniSAT	550.449	0	12	0
Solvers/PbO-CCSAT-Generic	455.5583	7	2	3
runtime_experiment	256.0682	9	21	12

Table 1: Parallel Portfolio Performance

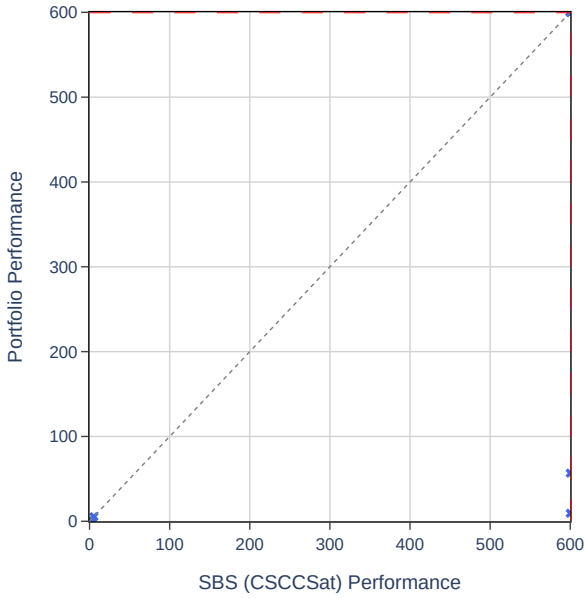

Figure 1: Portfolio vs SBS Performance (PAR10)

References

[1] Holger H. Hoos. Programming by Optimization. *Communications of the ACM*, 55(2):70–80, 2012.

[2] Holger H. Hoos. Sparkle: A pbo-based multi-agent problem-solving platform. Technical report, Department of Computer Science, University of British Columbia, 2015.