

# SAT Solving with distributed local search

Master Thesis of

## Guangping Li

At the Department of Informatics Institute of Theoretical informatics, Algorithmics II

Advisors: Dr. Tomáš Balyo

Prof. Dr. Peter Sanders

angegebenen Queller len als solche kenntl	ch, dass ich diese Arb n und Hilfsmittel benut ich gemacht und die S enschaftlicher Praxis i	tzt, die wörtlich oc atzung des Karlsr	der inhaltlich über uher Instituts für	rnommenen Ste Technologie zu
Karlsruhe, 1th Septe	ember 2018			

Abstract

Zusammenfassung

# Contents

1	Intr	Introduction						
	1.1	Problem/Motivation						
	1.2	Content						
	1.3	Definitions and Notations						
	1.4	The algorithms for comparison						
2	Our	local Solver						
	2.1	Probsat						
	2.2	Improvement through randomly generated solution						
	2.3	Improvement through random generator						
	2.4	Improvement through statistic						
	2.5	try star version						
3	Our	Parallel Algorithm 1						
	3.1	1st Approach: The pure portfolio approach (no partition)						
	3.2	2nd Approach: Star						
	3.3	3nd Approach: Hope						
	3.4	4th Approach: future						
4	Eval	luation 1						
	4.1	format						
	4.2	Benchmarks						
	4.3	Used plots and tables						
	4.4	Automatic parameter optimization						
	4.5	Experiments						
5	Con	clusion 2						
	5.1	Further work						
6	Bibl	iography 2						

#### 1 Introduction

- 1.1 Problem/Motivation
- 1.2 Content
- 1.3 Definitions and Notations
- 1.4 The algorithms for comparison
- 2 Our local Solver
- 2.1 Probsat
- 2.2 Improvement through randomly generated solution
- 2.3 Improvement through random generator
- 2.4 Improvement through statistic
- 2.5 try star version
- 3 Our Parallel Algorithm
- 3.1 1st Approach: The pure portfolio approach (no partition)
- 3.2 2nd Approach: Star
- 3.3 3nd Approach: Hope
- 3.4 4th Approach: future
- 4 Evaluation
- 4.1 format
- 4.2 Benchmarks
- 4.3 Used plots and tables

Different plots and tables are used to illustrate the results of the following experiments.  $Comparison\ Table$ 

Scatter Plot Cactus Plot Advantage Plot

- 4.4 Automatic parameter optimization
- 4.5 Experiments
- **5** Conclusion
- 5.1 Further work
- 6 Bibliography

### References