Solving TSPTW using combination of ACO algorithms

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INTRODUCTION

- The Traveling Salesman Problem with Time Windows (TSPTW) is a variant of the TSP with time constraints for visiting cities.
- This project introduces a new approach for solving TSPTW using multiple Ant Colony Optimization (ACO) algorithms.
- Several ACO variants (e.g., ACS, MMAS) run in parallel, each generating partial solutions.
- The best pheromone maps in each generation are selected and combined to guide the next generation of algorithms.
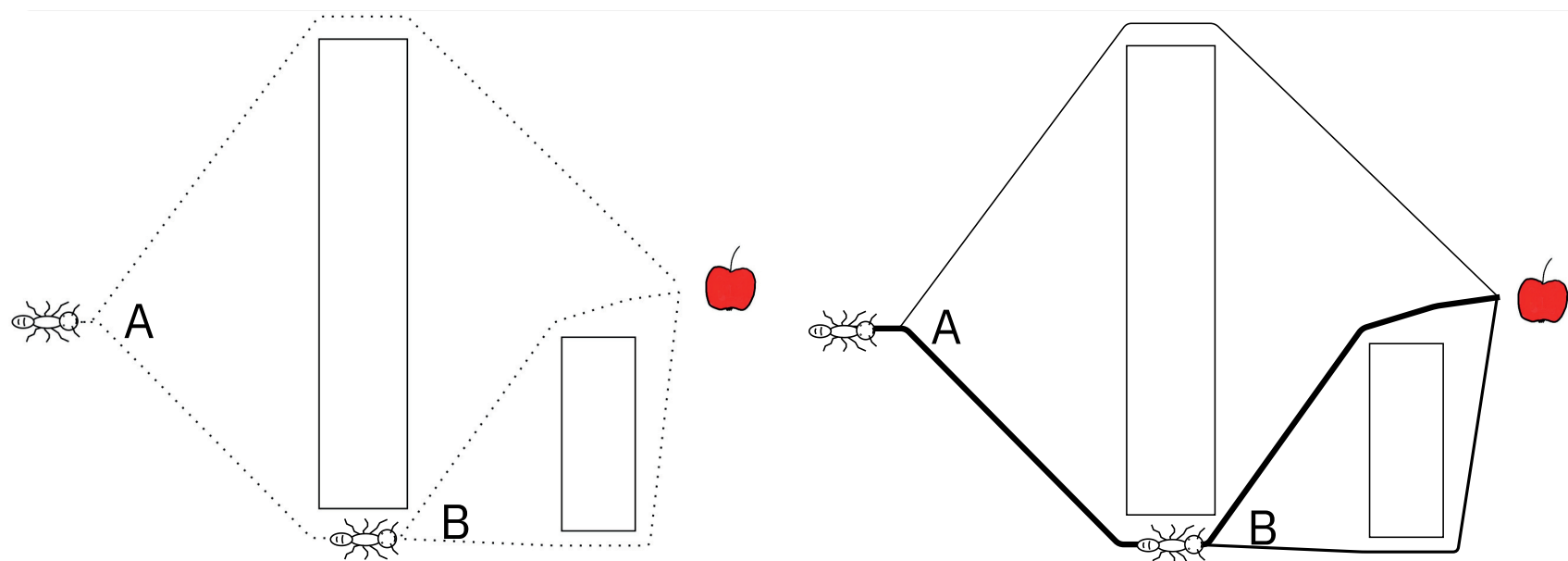

Figure 1: Illustration of ACO algorithm
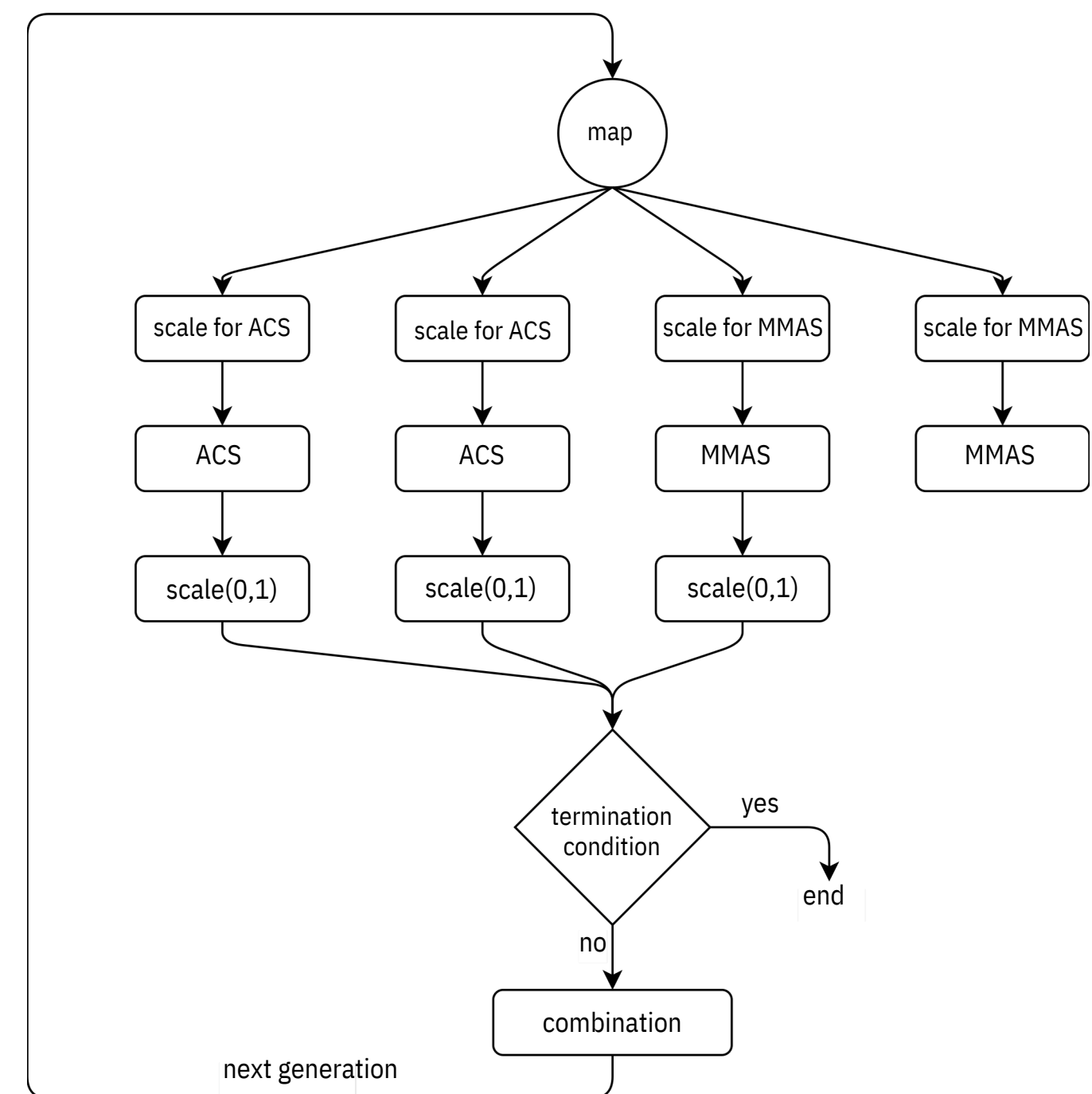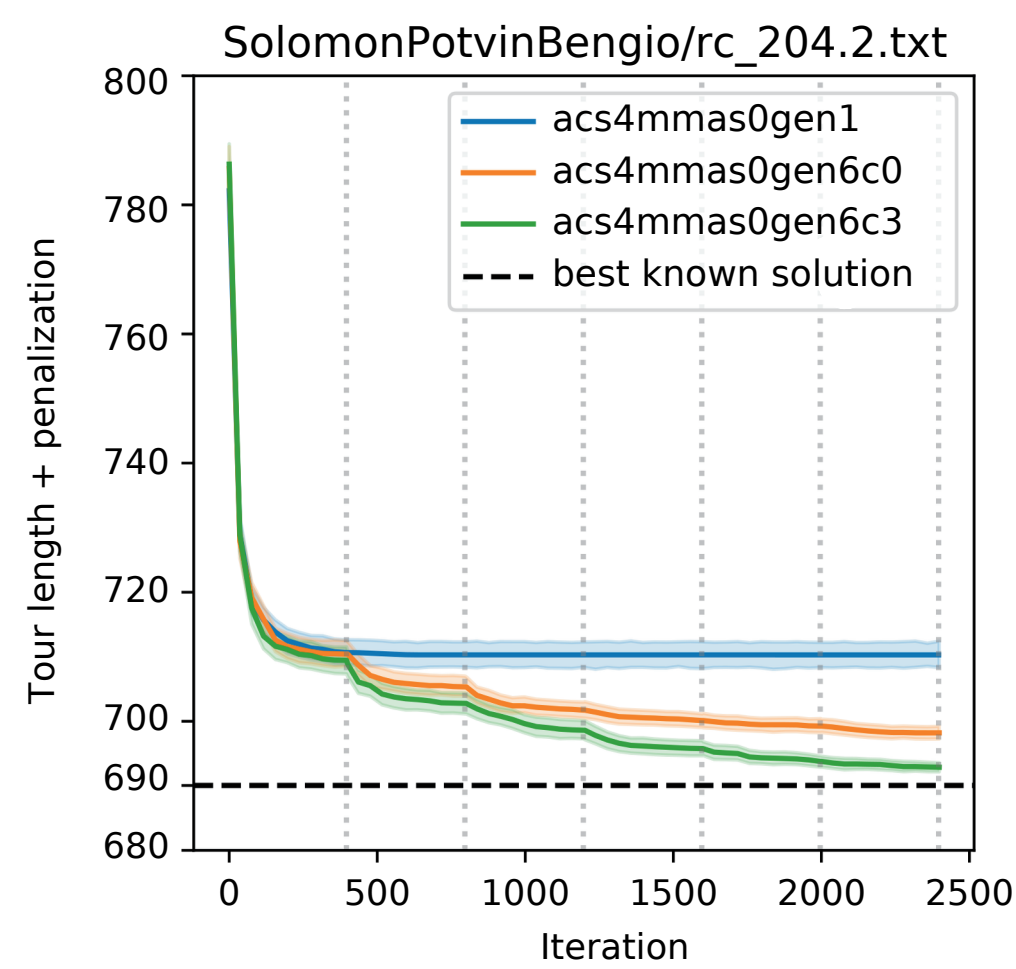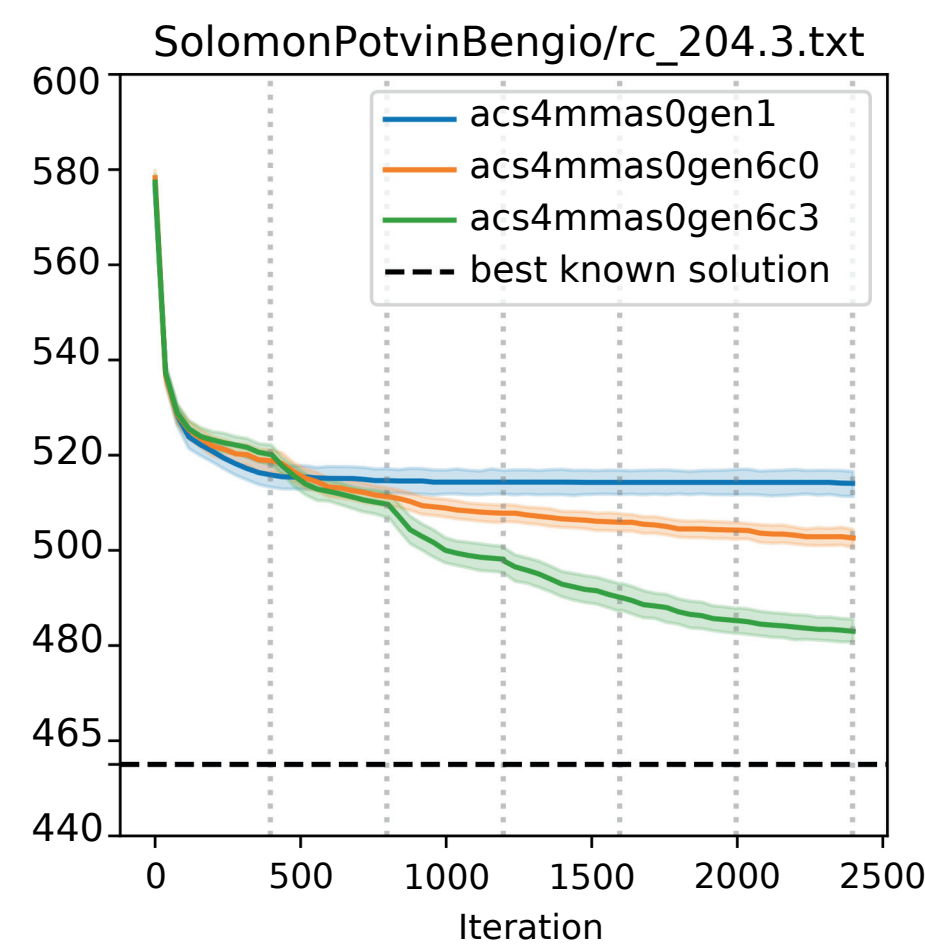
PROPOSED ALGORITHM

Figure 2: Proposed algorithm

ONE TYPE OF ACO ALGORITHM WITH PHEROMONE COMBINATION


Graph 1: Results of ACS with pheromone map combination

Setting	Difference [%]
mmas4gen1	0,80
mmas4gen6c0	1,02
mmas4gen6c3	0,82
acs4gen1	1,22
acs4gen6c0	0,90
acs4gen6c3	0,60

Table 1: Results of ACS and MMAS with combination of pheromone maps vs. without

COMBINATION OF ACS AND MMAS WITH PHEROMONE COMBINATION
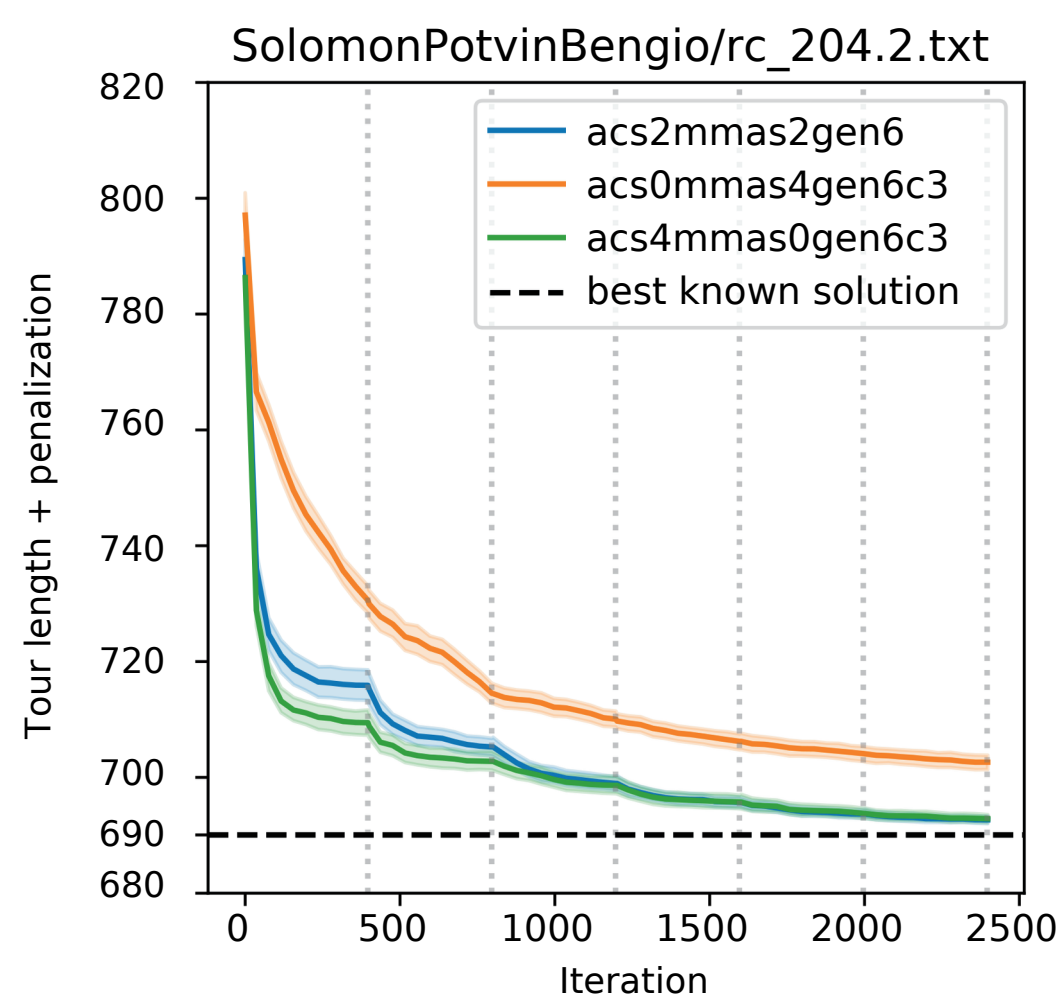
Graph 2: Results of combined ACS and MMAS with combination of pheromone maps
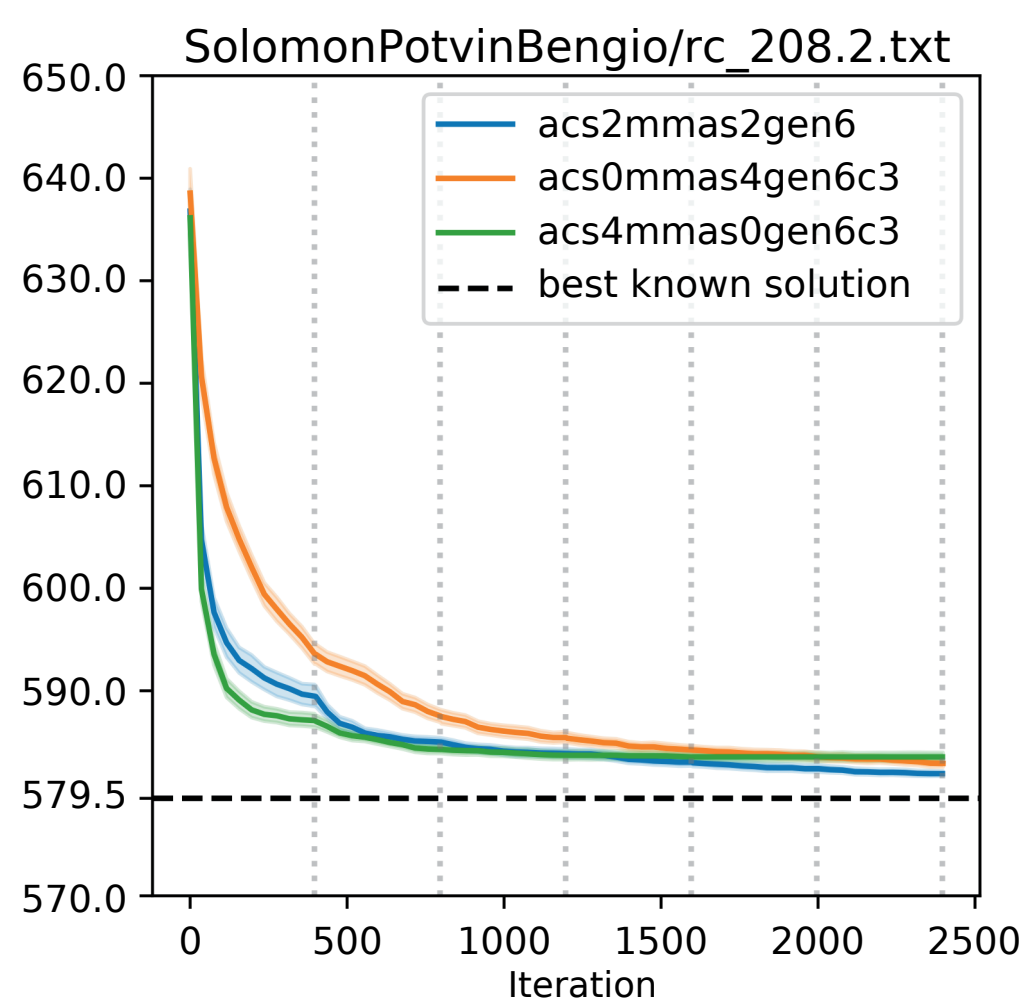
Setting	Difference [%]
acs0mmas4gen6	0,82
acs4mmas0gen6	0,60
acs2mmas2gen6	0,55

Table 2: Results of combination of ACO algorithms with combination of pheromone maps vs. without combination of algorithms