

# Consolidating LAMA with Best-First Width Search

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# LAMA

FF [  $s_1, s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{91}, s_{17}, \dots$  ]

LMC [  $s_3, s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

# LAMA

FF [  $s_1, s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{91}, s_{17}, \dots$  ]

LMC [  $s_3, s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

# LAMA

FF [  $s_1, s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{91}, s_{17}, \dots$  ]

LMC [  $s_3, s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

expand  $s_1$

# LAMA

FF [  $s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{91}, s_{17}, \dots$  ]

LMC [  $s_3, s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

expand  $s_{91}$

# LAMA

FF [  $s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{17}, \dots$  ]

LMC [  $s_3, s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

expand  $s_3$

# LAMA

FF [  $s_3, s_{42}, s_{91}, s_{17}, \dots$  ]

FF-pref [  $s_{17}, \dots$  ]

LMC [  $s_{42}, s_{91}, s_1, s_{17}, \dots$  ]

LMC-pref [  $s_{91}, s_1, s_{17}, \dots$  ]

and so on...

# BFWS

novelty of a state = size of smallest unseen tuple

partition state space: check novelty only for states in the same partition

partition = set of functions



# Our Contribution

FF	[ $s_3, s_{42}, s_{91}, s_{17}, \dots$ ]
FF-pref	[ $s_{17}, \dots$ ]
LMC	[ $s_{42}, s_{91}, s_1, s_{17}, \dots$ ]
LMC-pref	[ $s_{91}, s_1, s_{17}, \dots$ ]
BFWS	[ $\dots$ ]

# Motivation

LAMA and BFWS dominated the agile track in the last IPCs

what if we combine both?

# Agile Planning

find a plan as fast as possible

quality does not matter

in IPC: 5 minutes; 8 GiB

	Coverage	Agile Score
LAMA	2081	1737.43
BFWS( $f_6$ )	2042	1581.45

Total 2426 tasks in the benchmark set

- BFWS( $f_6$ ) :
1. novelty partitioned on LMC and FF
  2. state is preferred
  3. LMC
  4. novelty partitioned on FF
  5. FF

	Coverage	Agile Score
LAMA	2081	1737.43
LAMA-W( $f_6$ )	2029	1593.69
BFWS( $f_6$ )	2042	1581.45

LAMA-W( $f_6$ ) : LAMA +  
BFWS( $f_6$ ) open list

**BFWS( $f_6$ ) :**

1. novelty partitioned on LMC and FF
2. state is preferred
3. LMC
4. novelty partitioned on FF
5. FF

**BFWS**( $f_2^{\text{LM}}$ ) : 1. novelty partitioned on LMC  
2. LMC

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	Coverage	Agile Score
LAMA-W( $f_2^{\text{LM}}$ )	2113	1751.11
LAMA	2081	1737.43
LAMA-W( $f_6$ )	2029	1593.69
BFWS( $f_6$ )	2042	1581.45

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# Do we need all LAMA?

simpler BFWS worked better

can we *simplify* LAMA open lists?

# LAMA Revisited

FF

FF-pref

LMC

LMC-pref

BFWS( $f_2^{\text{LM}}$ )

# LAMA Revisited

FF

FF-pref

LMC

~~LMC-pref~~

BFWS( $f_2^{\text{LM}}$ )

# LAMA Revisited

FF

FF-pref

LMC

~~LMC-pref~~

BFWS( $f_2^{\text{LM}}$ )

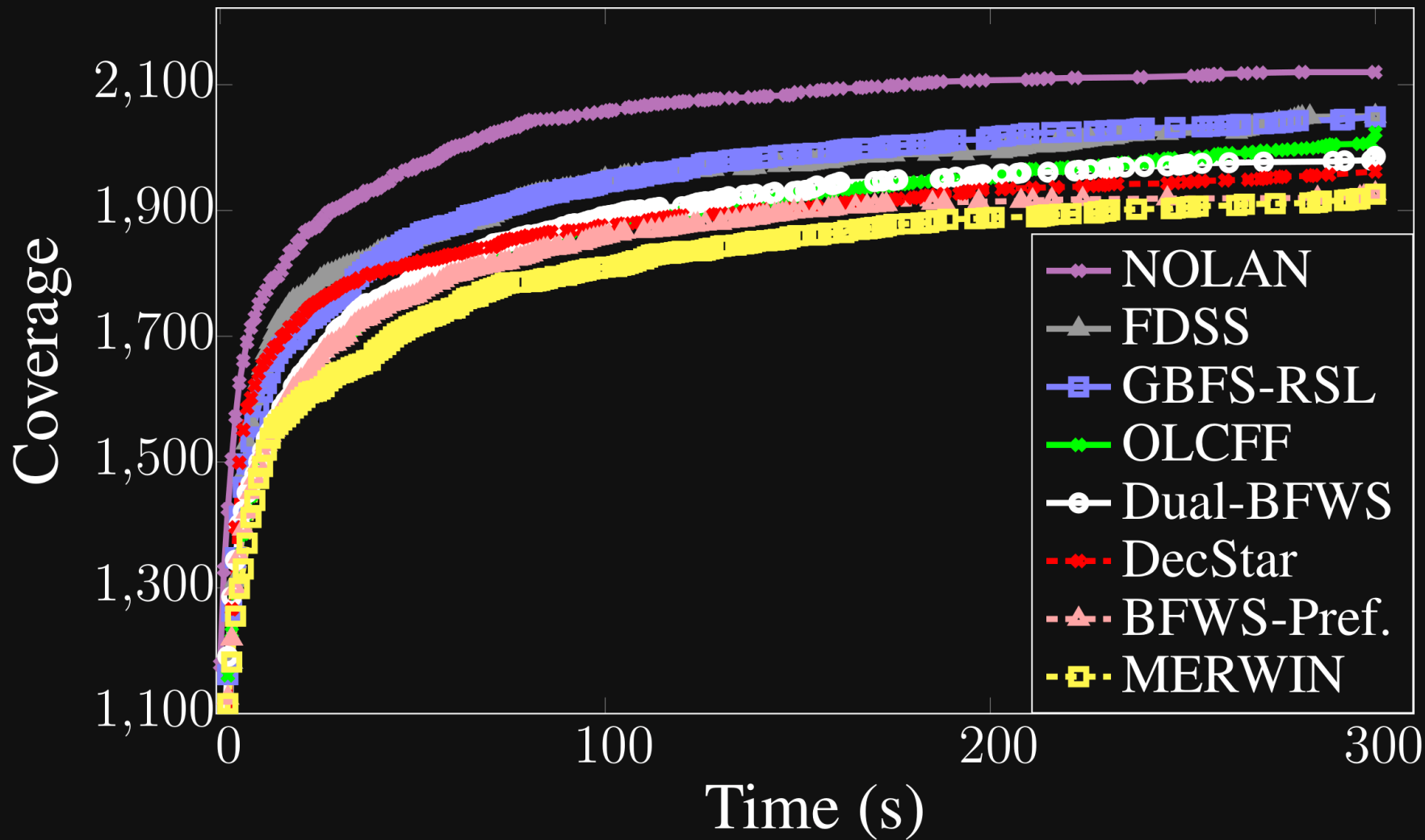
We call  
this planner

**NOLAN**

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	Coverage	Agile Score
<b>NOLAN</b>	<b>2120</b>	<b>1756.30</b>
LAMA-W( $f_2^{\text{LM}}$ )	2113	1751.11
LAMA	2081	1737.43
LAMA-W( $f_6$ )	2029	1593.69
BFWS( $f_6$ )	2042	1581.45

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# Conclusion

combining LAMA + BFWS  
works

need to use simpler BFWS

simplifying LAMA also helps