HEURISTIC SEARCH FOR FAST ROBOTIC MANIPULATION PLANNING

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Manipulation Planning

- **Planning for autonomous robot applications** - cooking, organizing a warehouse, disaster recovery, etc.

- **Task planning** - planning for abstract sequences of robot actions (pick, place, look, open, etc.)

- **Motion planning** - planning for specific motor movements
Swap Green and Blue Blocks
Modern planners take minutes to hours to solve

Result from discrete planning - powerful heuristic guesses are key to good empirical performance

State of the art - independent task and motion planning. Only uses a discrete task heuristic

FFRob - integrated task and motion planning. Uses a combined task and motion heuristic
Swap Green and Blue Blocks

**Task 4**

**Plan length**
9 picks
9 places
493 movements

**Planing resources**
24s preprocessing
15s search
74 states explored
Median Plan Time

300s Timeout

Task 1

Task 2

Task 3

Task 4

Task 5

Task 6

Uninformed

State of the art

FFRob

0s

60s

120s

180s

240s

300s

SuperUROP
Thank you!

Task 6

Questions?