Minimum Cycle Time Motion Planning for Bin Picking

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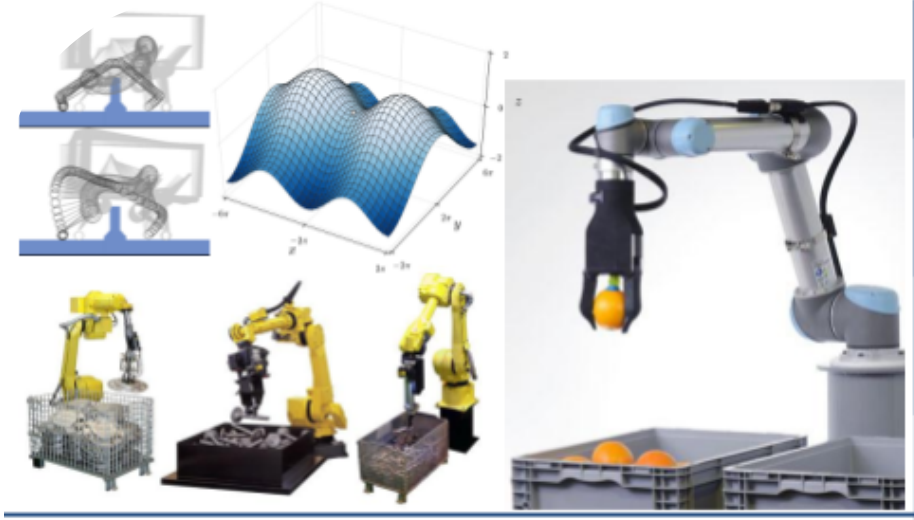

Approach

- Create standardized cycle time benchmark for common industrial applications
- Merge in forked FCL collision checking
- Update OMPL, STOMP, CHOMP, and SBPL motion planners
- Leverage existing work and pull back into MoveIt!
- Investigate performance of competing planners
- Document planner results and create tutorials for approaches

Metrics for success:

- Demonstrate which planner has min cycle time
- Compare cutting-edge approaches against each other
- Make out-of-the-box planning easy to achieve min cycle time

Motion / Objective

- Motivation: in industrial applications like bin picking, a robotic arm's executed trajectory needs to be optimal to reduce the cycle time of the overall process. Planning time must also be minimized when varying conditions require online planning. MoveIt! currently only supports by default one approach to motion planning that produces non-optimal paths.
- Objectives: integrate existing academic motion planners into MoveIt! that have potential to improve cycle time, optimize existing planners, and systematically compare performance for industrial use cases.

Cost / Schedule

- Cost: $24K
- Expected participants: 2

	M1	M2	M3	M4
Industrial benchmark				
FCL Improvements				
OMPL, STOMP, CHOMP, SBPL Improvements				
Study comparison				

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