Box and Blocks Test Benchmark I, II, IIIa, IIIb

Reference No / Version	B-BBT-1.1.0
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Adopted Protocol	Box and Blocks Test Protocol X (P-BBT-1.X.0)
Scoring	All: Time to complete the task (total time, planning time, and manipulator/gripper execution time) is not directly factored into the score but must be reported. The planning time includes the amount of time required to plan an arm trajectory or plan a grasp, and the execution time is the amount of time the arm or the end effector is in motion. Finally, the total time is the amount to the from task start to task completion. While not reported, the amount of time that is not accounted for in the difference between the planning/execution and total time, will be the time dedicated to perception and decision making. Protocol I: All picks must be of an individual block. If more than one block is picked, the task must be restarted with a score of 0. A reported score of 16 signifies the task was successfully completed. Each successful transfer is one point. (Max. 16) Protocol II: All picks must be of an individual block. If more than one block is picked, the task must be restarted with a score of zero for that execution. A point is awarded if the block is successfully placed within the desired target place location and remains there until the end of the task, i.e. the edges of the template are visible around the placed cube. (Max. 16) Protocol III: Picks of one of more blocks counts as a single point. Report the number of points achieved during execution in addition to the total number of blocks transferred. (Max. 100)
Details of Setup	• Relative location of the setup with respect to the robot

Results to Submit	• Score (successful transfers as defined by the individual protocol)
	• (S-BBT only) Total blocks transferred
	• (S-BBT only) Total number of picks attempted
	• Distance the end effector traveled
	• Time (s)
	  • Total Time
	  • Planning Time (grasp and motion planning)
	  • Execution Time (time robot is moving)
	• System Description as necessary (Robot make/model, end effector make/model, and processor speed / number of cores used for perception and planning if a custom implementation is used)

	• Provide detailed comments on:
	  • Perception technique
	  • What makes the system successful?
	  • What makes the system fail?
	  • What kind of improvements will increase speed and performance?