

TBM 1: Prepare Assembly Aid Tray for Force Fitting

Team name: _____

Referee I: _____, Referee II: _____

Date and time: _____

Duration: _____ ☐ Timeout

Achievements

	yes	no
The robot correctly grasp the assembly aid tray: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>
The robot correctly grasp the first bearing box: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>
The robot correctly grasp the second bearing box: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>
The robot insert the first bearing box into the aid tray: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>
The robot insert the second bearing box into the aid tray: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>
The robot correctly deliver the tray to the force fitting station: Comment: _____	<input type="checkbox"/>	<input type="checkbox"/>

Penalized Behaviors

The robot bumps into obstacles in the test bed:	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
The robot drops an object (the object touches the ground):	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
The robot stops working:	<input type="checkbox"/>

Disqualifying Behaviors

The robot damages or destroys the objects requested to manipulate:	<input type="checkbox"/>
The The robot damages the test bed:	<input type="checkbox"/>

Benchmarking data delivered appropriately: ☐ yes / ☐ no

Team leader signature: _____

Referee signature: _____

TBM 2: Plate Drilling

Team name: _____

Referee I: _____, Referee II: _____

Date and time: _____

Duration: _____ ☐ Timeout

Notes on TBM 2 to teams/referee/organizer:

1. The cover plates are organized in the conveyor belt with the order of **unusable-unusable-faulty-faulty** (yes, specifically in this order). The reasoning is because processing unusable cover plate is “simpler” than processing faulty ones. As such the only way to ensure fairness is to have a specific ordering of the cover plates.

2. **Each cover plates needs to be processed entirely before the robot move on to processing the next cover plate.** Unusable cover plate should be delivered to the trash container box and faulty cover plate should be fixed with the drilling machine. Please note that processing of each cover plates doesn't have to be succesful, yet the robot need to show the expected behavior to complete the process. This is to prevent any achievement mining (e.g. repeatedly only picking a cover plate from the conveyor belt's exit ramp).

Achievements

Cooperate with CFH and Networked Devices throughtout the task

☐

Comment: _____

This is marked when the robot is, at the least, receive its task from CFH AND operate quality control camera.

~~The robot collect the cover plate box from the shelves~~

~~The robot correctly grasp the plates~~

The robot pick up a cover plate from the conveyor belt exit ramp

☐ ☐ ☐ ☐

Comment: _____

Lifting up the cover plate is considered a success.

~~The robot place the cover plate box to the correct workspace~~

~~The robot correctly sort the plates~~

The robot place the unusable cover plate inside the trash box container

☐ ☐

Comment: _____

~~The robot perform the drilling process for faulty plates~~

The robot place a cover plate in the drilling machine

☐ ☐

Comment: _____

The robot pick up a cover plate in the drilling machine

☐ ☐

Comment: _____

Again, lifting up the cover plate is considered a success.

The robot place a cover plate inside the cover plate box

☐ ☐

Comment: _____

Penalized Behaviors

The robot bumps into obstacles in the test bed: ☐ ☐ ☐ ☐ ☐

~~The robot drops a plate:~~

The robot collide with a networked device: ☐ ☐ ☐ ☐ ☐

Disqualifying Behaviors

~~The robot damages or destroys the objects requested to manipulate:~~

~~The robot damages the test bed:~~

The robot damages the test bed: ☐

Comment: _____

WARNING: A disqualifying behaviors discard all other achievement in the current task. Use it only when it is really necessary (e.g. cheating).

Benchmarking data delivered appropriately: ☐ yes / ☐ no

Team leader signature: _____

Referee signature: _____

RD: This is a very good first draft for TBM2

TBM 3: Fill a Box with Parts for Manual Assembly

Team name: _____

Referee I: _____, Referee II: _____

Date and time: _____

Duration: _____ ☐ Timeout

Achievements

	part 1	part 2	part 3	part 4	part 5
The robot correctly grasp object:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The robot place object in the container:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comment: _____

	yes	no
The robot correctly grasp the container	<input type="checkbox"/>	<input type="checkbox"/>
The robot correctly place the container (complete with all parts)	<input type="checkbox"/>	<input type="checkbox"/>

Comment: _____

Penalized Behaviors

The robot bumps into obstacles in the test bed: ☐ ☐ ☐ ☐ ☐

The robot drops an object: ☐ ☐ ☐ ☐ ☐

The robot stops working: ☐

Disqualifying Behaviors

The robot damages or destroys the objects requested to manipulate: ☐

The robot damages the test bed: ☐

Benchmarking data delivered appropriately: ☐ yes / ☐ no

Team leader signature: _____

Referee signature: _____

FBM 1: Object Perception

Team name: _____

Referee I: _____, Referee II: _____

Date and time: _____

Notes:

- The duration is based on the referee stop watch.
- Timeout is checked when the robot cannot detect the object within the specified test duration.
- GT is the ground truth which is the information provided by the referee box.
- Object identifier:
 - EM-01(1)=aid tray, EM-02(2)=cover plate box
 - AX-01(4)=bearing box type A, AX-16(3)=bearing box type B
 - AX-02(6)=bearing, AX-09(7)=motor, AX-03(5)=axis

Run 1 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 2 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 3 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 4 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 5 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 6 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 7 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 8 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 9 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Run 10 Duration: _____ ☐ Timeout

Object Detection

GT	Container		Bearing Box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container		Bearing box		Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)

Pose

GT	x	y	θ	Robot	x	y	θ

Comments: _____

Benchmarking data delivered appropriately: ☐ yes / ☐ no

Team leader signature: _____

Referee signature: _____

FBM 2: Visual Servoing

Team name: _____

Referee I: _____, Referee II: _____

Date and time: _____

Notes:

- The duration for each run is based on the referee stop watch.
- Timeout is checked when the robot cannot grasp the object within the specified test duration.
- The sequence of objects which are used in each run is defined by the team.
- Objects: EM-01=aid tray orange, EM-02=cardbox black, AX-01=bearing box type A, AX-16=Bearing box type B, AX-02=bearing, AX-03=axis, AX-09=motor

Run 1 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 2 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 3 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 4 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 5 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 6 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Run 7 Duration: _____ ☐ Timeout

Object id: _____, Orientation: _____, ☐ Success, ☐ Dropped, ☐ Missed

Comments: _____

Benchmarking data delivered appropriately: ☐ yes / ☐ no

Team leader signature: _____

Referee signature: _____