TBM 1: Prepare Assembly Aid Tray for Force Fitting

Team name:					
Referee I:, Referee II:					
Date and time:					
Duration: □ Timeout					
Achievements					
The robot correctly grasp the assembly aid tray: Comment:	yes	nc			
The robot correctly grasp the first bearing box: Comment:	_				
The robot correctly grasp the second bearing box: Comment:	_				
The robot insert the first bearing box into the aid tray: Comment:					
The robot insert the second bearing box into the aid tray: Comment:	_				
The robot correctly deliver the tray to the force fitting station: Comment:	_				
Penalized Behaviors					
The robot bumps into obstacles in the test bed: \Box \Box \Box \Box					
The robot drops an object (the object touches the ground): \Box \Box \Box \Box					
The robot stops working: \Box					
Disqualifying Behaviors					
The robot damages or destroys the objects requested to manipulate: \qed					
The The robot damages the test bed: $\hfill\Box$					
Benchmarking data delivered appropriately: \square yes $/$ \square no					
Team leader signature:					
Referee signature:					

TBM 2: Plate Drilling

Referee I:	
Notes on TBM 2 to teams/referee/organizer: 1. The cover plates are organized in the conveyor belt with the order of unusaunusable-faulty-faulty (yes, specifically in this order). The reasoning is because proceunusable cover plate is "simpler" than processing faulty ones. As such the only way to enfairness is to have a specific ordering of the cover plates. 2. Each cover plates needs to be processed entirely before the robot move to processing the next cover plate. Unusable cover plate should be delivered to the teacher.	
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container box and faulty cover plate should be fixed with the drilling machine. Please that processing of each cover plates doesn't have to be successful, yet the robot need to the expected behavior to complete the process. This is to prevent any achievement mining repeatedly only picking a cover plate from the conveyor belt's exit ramp).	ssing nsure e on trash notes
Achievements	
Cooperate with CFH and Networked Devices througout 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	

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 reque	ested to manipulate:	
The robot damages the test bed:		
The robot damages the test bed:		_
Comment:		
WARNING: A disqualifying behaviors discard all other achievement only when it is really necessary (e.g. cheating).	t in the current task. Use it	
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:		, Ref	eree II:				
Date and time:							
Duration: □ T	imeout						
Achievements							
The robot communicates with CFH through out the test:	part 1	part 2	part 3	part 4	part 5	container	
The team submit the benchmarking data by the end of the test:							
The robot picks up a required object or container from its storage location:							
The robot delivers a correctly filled container at the designated workstation:							
Comment:							_
The robot correctly grasp the	e contair	ner			yes	no	
The robot correctly place the	e contain	er (comp	plete wit	h all par	ts)		
Comment:							_
Penalized Behaviors							
The robot bumps into obstac	cles in th	e test be	ed: 🗆 🗆				
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: \square yes / \square no	
Team leader signature:	
Referee signature:	

FBM 1: Object Perception

Referee	I:	, Re	feree II: _			
Date an	nd time:					
Notes:						
• Th	e duration is based on	the referee sto	p watch.			
	meout is checked when ration.	the robot ca	nnot detec	t the object	within the	specified test
• GT	is the ground truth w	which is the infe	ormation p	rovided by t	the referee b	OX.
• Ob	ject identifier:					
-	– EM-01(1)=aid tray,	EM-02(2) = cov	er plate bo	ΟX		
	- AX-01(4)=bearing b				me B	
	- AX-02(6)=bearing,	· -	` /	· ·	ров	
	1111 02(0) 50011118,	111 00(1) 11100	,01, 1111 00	(9) (1111)		
Run 1 I	Ouration:	☐ Timeout				
Object I	Detection					
CT	Container	Bearing	g Box		Transmissio	n
GT	EM-01(1) EM-02(2	()	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Container	Bearin			Transmissio	
	EM-01(1) EM-02(2	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose			11 11		T	
GT	х у	θ	Robot	X	У	θ
Commen	ts:					
Run 2 I	Ouration:	☐ Timeout				
Object I	Detection					
GT	Container	Bearing	_	II	Transmissio	
	EM-01(1) EM-02(2		AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	$\begin{array}{ c c c }\hline Container\\\hline EM-01(1) & EM-02(2\\\hline \end{array}$	Bearin AX-01(4)	$\frac{\text{g box}}{\text{AX-16(3)}}$	AX-02(6)	$\frac{\text{Transmissio}}{\text{AX-09(7)}}$	n AX-03(5)
Pose			()	<u> </u>		1 7
GT	x y	θ	Dolor	X	у	θ
C = 1	H		Robot		-	+

Joject L	Octoction							
	Detection		·		П			
GT	Conta		Bearin		III.	Transmission		
0.1	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Robot	Conta	ainer	Bearin	g box		Transmission	n	
TODOU	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose								
- CTF	X	у	θ	D 1 .	X	у	θ	
GT				Robot		V		
Common	its:							
Jonninen								
Run 4 I	Ouration:	Г] Timeout					
Object L	Detection							
GT	Container		Bearing Box		Transmission			
01	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		
Robot	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose					-11			
	37	177	θ		37	37	θ	
GT	X	У	0	Robot	X	У	U	
Commen	its:							
Run 5 I	Ouration:] Timeout					
Object I	Detection							
	Conta	ainer	Bearing Box		Transmission			
GT	EM-01(1)	EM-02(2)	AX-01(4)	$\frac{AX-16(3)}{AX-16(3)}$	AX-02(6)	AX-09(7)	$\frac{1}{\text{AX-03(5)}}$	
	Conta	` ,	Bearin	. ,		Transmission		
Robot	EM-01(1)	EM-02(2)	AX-01(4)	$\frac{\text{AX-16}(3)}{\text{AX-16}(3)}$	AX-02(6)	AX-09(7)	$\frac{1}{ AX-03(5) }$	
	DW-01(1)	DW-02(2)	1121-01(4)	7171-10(0)	1111-02(0)	1171-03(1)	1171-05(0)	
Pose			θ		v	37	θ	
Pose GT	X	У	0	Robot	X	У	U	

	$\frac{\text{Detection}}{\ }$	ainer	Bearin	g Roy		Transmission		
GT	EM-01(1)		AX-01(4)	$\frac{\text{g box}}{\text{AX-16(3)}}$	AX-02(6)	AX-09(7)	AX-03(5)	
	Cont	` '	Bearin	. ,	` ′	Transmissio		
Robot	EM-01(1)	$\frac{\text{EM-02}(2)}{\text{EM-02}(2)}$	AX-01(4)	$\frac{\text{AX-16}(3)}{\text{AX-16}(3)}$	AX-02(6)	AX-09(7)	AX-03(5)	
Pose		2111 02(2)	1111 01(1)	1111 10(0)	1111 02(0)	1111 00(1)	1111 00(0)	
	X	у	θ		X	у	θ	
GT	A .	J J		Robot	A	J .		
 Comme	nts:							
Run 7	Duration:] Timeout					
Object 1	Detection							
OTT.	Container		Bearin	Bearing Box		Transmissio	n	
GT	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Robot	Cont	ainer	Bearin	g box		Transmissio	n	
πουσι	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose								
GT	X	У	θ	Robot	X	У	θ	
Comme	nts:							
Run 8	Duration:	Г] Timeout					
			1 Imeout					
Jbject 1	Detection							
GT	Cont		Bearin			Transmissio		
O I	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7) Transmissio	AX-03(5)	
———	Container		Bearin AX-01(4)	~				
Robot	EM 01(1)		AA-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Robot	EM-01(1)	EM-02(2)						
	EM-01(1)	EMI-02(2)						
Robot	EM-01(1)	у у	θ	Robot	X	у	θ	

Run 9 I	Ouration:] Timeout				
Object I	Detection						
GT	Container Bearing Box		ig Box	Transmission			
GI	EM-01(1)	EM-02(2)) AX-01(4) AX-16(3) A		AX-02(6)	AX-09(7)	AX-03(5)
Dobot	Cont	ainer	Bearin	ng box		Transmission	n
Robot	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose							
C/T	x	у	θ	Dalas	X	у	θ
GT				Robot			
	nts: Duration: _		□ Timeout				
	Detection =						
C/T/	Cont	ainer	Bearin	ıg Box		Transmission	n
GT	EM-01(1)	EM-02(2)	AX-01(4)		AX-02(6)	AX-09(7)	AX-03(5)
Robot	Cont	ainer	Bearin	ng box		Transmission	n
Robot	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose							
GT	X	У	θ	Robot	X	у	θ
Commen	nts:						
Benchn	narking dat	a delivered	l appropria	ately: 🗆 ye	es / 🗆 no		
Team le	eader signa	ture:					
Referee	signature:						

FBM 2: Visual Servoing

Team name:		
Referee I:	, Refere	ee II:
Date and time:		
Notes:		
• The duration for each	ch run is based on the re	eferee stop watch.
• Timeout is checked duration.	when the robot canno	t grasp the object within the specified test
• The sequence of objection	ects which are used in e	each run is defined by the team.
v	0 0 /	cardbox black, AX-01=bearing box type A, eg, AX-03=axis, AX-09=motor
Run 1 Duration:	Timeout	
		, \square Success, \square Dropped, \square Missed
Comments:		
Run 2 Duration:	□ Timeout	
Object id:	, Orientation:	, \square Success, \square Dropped, \square Missed
Comments:		
Run 3 Duration:	Timeout	
Object id:	, Orientation:	, \square Success, \square Dropped, \square Missed
Comments:		
Run 4 Duration:	□ Timeout	
Object id:	, Orientation:	, \square Success, \square Dropped, \square Missed
Comments:		
Run 5 Duration:	□ Timeout	
Object id:	, Orientation:	, \square Success, \square Dropped, \square Missed
Comments:		

Run 6 Duration:	\square Timeout	
Object id:	, Orientation:,	\Box Success, \Box Dropped, \Box Missed
Comments:		
Run 7 Duration:		
Object id:	, Orientation:,	\square Success, \square Dropped, \square Missed
Comments:		
Benchmarking data deliver	red appropriately: \square yes	s / \square no
Team leader signature:		
Referee signature:		