DUAL-ARM CLOTH MANIPULATION BENCHMARK- DRESSING

Reference No / Version	B-DACM-D-0.1
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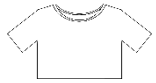
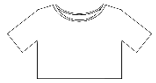
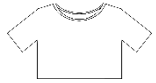
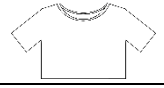
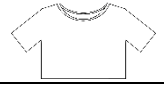
Adopted Protocol	P-DACM-D-0.1
Scoring	Fill the attached table or use the provided xls or ods sheet according to the following rules. Specify the head size, if **[sh]** or **[bh]**. Depending on the starting configuration, either **[pg2]**, **[pg1]**, **[cr]** or **[fd],** fill out the respective table. For each trial, report the following scores: 1. Success **[MAN]**: report 1 if the **[MAN]** phase (see flow chart) is successfully executed, 0 otherwise; 2. Success **[GR2]**: in cases **[pg1]**, **[cr]**, **[ft], [fd]**, report 1 if the **[GR2]** phase (see flow chart) is successfully executed, 0 otherwise. A failure is considered if the cloth is lost during task execution or if the cloth is not unfolded in case of **[fd]**. Do not report any value in case **[pg2]**; 3. Success **[GR1]**: in cases **[cr]**, **[ft], [fd]**, report 1 if the **[GR1]** phase (see flow chart) is successfully executed, 0 otherwise. A failure is considered if the cloth is lost during task execution or if the cloth is not unfolded in case of **[fd]**. Do not report any value in cases **[pg2]** and **[pg1]**; 4. Execution time: measure the time in seconds for the system to complete the task. Time starts when the autonomous dressing is started and ends when the dressing task is completed (see flow chart); 5. Forces on head: if the used system is equipped with force/torque sensors report the minimum, maximum and average norms of the forces at the end effectors measured during the **[MAN]** phase. Note that data from both manipulators must be considered. **[MAN]** phase can be paused in case re-grasping is performed

	and then it resumes when two points are grasped again. In case no sensors are available, ignore these measures; 6. Grasping points: put a snapshot clearly representing the grasping points or indicate the grasping points on the T-shirt template. Note that, for scores 1-3, the following conditions are considered failures: collision between any part of the robots and the head, displacement of the head, damage to the head or to the T-shirt. If a phase fails, the following phases must be considered failed as well. In case of failed trials, no scores for execution time and forces must be assigned. Specify which assumptions are considered among the following ones: ● The position of the head is known; ● The color of the head is known; ● The shape of the head is known; ● The color and pattern of the T-shirt are known; ● The dimensions of the T-shirt are known; ● T-shirt position on planar surface in cases **[ft]** and **[fd]**; ● The illumination condition can not vary. Report any additional assumption considered to solve the task (e.g. adding an AR-code on the shirt). Finally, fill the summary section comprising the following information (it is automatically filled if the xls or ods scoresheets are used): ● Success rate for each phase; ● Average and variance of the execution time; ● Average and variance of the minimum force norm over successful trails (if available); ● Average and variance of the maximum force norm over successful trails (if available); ● Average and variance of the mean force norm over successful trails (if available); ● Number of assumptions needed from the given list; ● Use of further assumptions (yes/no depending on if new assumptions are considered or not). Note that in case more than one sub-tasks are addressed, the respective tables must be filled.
Details of Setup	Provide a detailed description of: ● Robots; ● End effectors; ● Utilized sensors; ● T-shirt with supplier, measures and material;

	● Workstation specification; ● Software architecture.
Results to Submit	Videos of each trial including the dropping phase in case of starting configuration **[cr]**; Filled out scoresheet; Detailed comments on: ● What makes the system successful? ● What makes the system fail? ● What was improved compared to other methods? ● Chosen grasping points and/or grasping strategy.

Head size	**([sh] | [bh])**											
Starting config.	**Success [MAN] (1 | 0)**	**Success [GR2] (1 | 0)**	**Success [GR1] (1 | 0)**	**Time in sec**	**Force measures (norm in N)**			**Grasping points**	**Assumptions**	**Used (YES | NO)**	**Assumptions**	**Used (YES | NO)**	**New assumptions**
					min	*avg*	*max*						
([pg2] | [pg1] | [cr] | [ft] | [fd])									Head position		T-shirt position		
									Head color		Illumination changes		
									Head shape				
									T-shirt color				
									T-shirt dimensions				
Summary:	**0.00%**	**0.00%**	**0.00%**	**avg: -**	**avg: -**	**avg: -**	**avg: -**		**Assumptions:**	**0/7**	**New assumptions:**		**NO**
				var: -	**var: -**	**var: -**	**var: -**						