TRANSLATION RANGE OF MOTION BENCHMARK

Reference No / Version	B-TRM-0.01
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Adopted Protocol	In-Hand Translation Protocol (P-IHT-0.01)
Scoring	Assessment is based on the range of motion metric m, obtained through the following steps: 1) Align the recorded object translation point clouds with respect to their maximum and minimum offsets in the x, y and z axis. 2) Merge the point clouds. 3) Compute the volume of a convex hull V_{ch} around the merged point clouds. 4) Scale the convex hull volume to the cube of the hand aperture a. 5) Obtain the metric m by computing the base-10 logarithm of the above fraction: $m = \log_{10} \frac{V_{ch}}{a^3}$ As the reachable workspace volume will always be smaller than the aperture cube, the metric m will be negative. In the ideal case, where achievable workspace matches the aperture cube, m will be 0. The assessed hands are therefore compared based on this value, where a less negative score corresponds to a larger translation workspace and better performance. The metric is computed for each sensorized object.
Details of Setup	To assist with data processing and metric computation, code samples are provided.
Results to Submit	For each sensorized object: • Assessed hand model and control details. • Computed metric m. • Plots of recorded point cloud with overlaid convex hull. • Comments on obtained results with respect to the hand model and control.