ROTATION REPEATABILITY BENCHMARK

Reference No / Version	B-RR-0.01
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Adopted Protocol	Any protocol that involves periodic object rotation (P-IHR-0.01, P-GT-0.01, P-GR-0.01).
Scoring	Assessment is based on the cycle end point variation. For each recorded periodic manipulation motion: 1) Isolate motion cycle start and end points. 2) Compute the mean drift vector (Benchmark B-RD-0.01) and subtract it from subsequent endpoints to eliminate drift. 3) Compute covariance matrix of the end points. 4) Perform eigenvalue decomposition on the covariance matrix and extract the largest eigenvalue λ_{max}. 5) Compute the square root of the largest eigenvalue $\sqrt{\lambda_{max}}$. The result $\sqrt{\lambda_{max}}$ corresponds to the standard deviation along the dominant principal component and characterizes the largest spread of the manipulation motion end points. A lower score corresponds to better repeatability. The computation is performed for every sensorized object.
Details of Setup	To assist with data processing and metric computation, code samples are provided.
Results to Submit	For each sensorized object and manipulation motion: • Assessed hand model and control details. • Computed $\sqrt{\lambda_{max}}$. • Plots of recorded point clouds with appropriately offset and highlighted end points. • Comments on obtained results with respect to the hand model and control.