Description of trajectories	
Production trajectory	Within this variant, measurements are taken during the production trajectory of the robot. The length of one measurement equals one production cycle.
Measurement trajectory with isolated long movements	Using this trajectory, isolated movements with preferably large angle range are executed for each axis for the measurement.
Measurement trajectory with combined short movements	Using this trajectory, a combined movement of all axis in a small angle range (< 10° per axis) are executed for each axis for the measurement.
Measurement trajectory with force excitation	Using this trajectory, the robot is decelerated as quick as possible from a movement with high velocities by using the robot's mechanical brakes. The measurement is taken during the remaining mechanical oscilation of the robot after the braking procedure.

Economic efficiency

Please compare the programming effort for the different trajectories (3 smaller effort, 2 same effort, 1 larger effort)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		3	3	3	1,00
Measurement trajectory with isolated long movements	1		2	2	0,56
Measurement trajectory with combined short movements	1	2		2	0,56
Measurement trajectory with force excitation	1	2	2		0,56

Please compare the effort for hardware changes to be able to execute the different trajectories automatically (3 smaller effort, 2 same effort, 1 larger effort)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		3	3	3	1,00
Measurement trajectory with isolated long movements	1		2	3	0,67
Measurement trajectory with combined short movements	1	2		3	0,67
Measurement trajectory with force excitation	1	1	1		0,33

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		3	3	3	1,00
Measurement trajectory with isolated long movements	1		2	2	0,56
Measurement trajectory with combined short movements	1	2		2	0,56
Measurement trajectory with force excitation	1	2	2		0,56

Please compare the additional time needed during production to execute the trajectories (3 less time, 2 equal time, 1 more time)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		3	3	3	1,00
Measurement trajectory with isolated long movements	1		1	1	0,33
Measurement trajectory with combined short movements	1	3		2	0,67
Measurement trajectory with force excitation	1	3	2		0,67

Data quality

Please compare the influences of movements by other axes on the measurement data for a specific axis (3 minor influence, 2 equal influence, 1 major influence)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		1	2	2	0,56
Measurement trajectory with isolated long movements	3		3	3	1,00
Measurement trajectory with combined short movements	2	1		2	0,56
Measurement trajectory with force excitation	2	1	2		0,56

Please evaluate to what extent the trajectory can be used to identify damage of specific parts (e.g. bearing ring) (3 higher suitability, 2 equal suitability, 1 lower suitability)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		1	1	1	0,33
Measurement trajectory with isolated long movements	3		3	3	1,00
Measurement trajectory with combined short movements	3	1		2	0,67
Measurement trajectory with force excitation	3	1	2		0,67

Please evaluate to what extent the trajectory can be used to identify damage in functional groups (e.g. gears) (3 higher suitability, 2 equal suitability, 1 lower suitability)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		1	1	1	0,33
Measurement trajectory with isolated long movements	3		2	2	0,78
Measurement trajectory with combined short movements	3	2		2	0,78
Measurement trajectory with force excitation	3	2	2		0,78

Please compare in how far program changes of the production trajectory have an influence on the measurement based on the considered trajectory (3 smaller influence, 2 equal influence, 1 larger influence)!

	Production trajectory	Measurement trajectory with isolated long movements	Measurement trajectory with combined short movements	Measurement trajectory with force excitation	
Production trajectory		1	1	1	0,33
Measurement trajectory with isolated long movements	3		2	2	0,78
Measurement trajectory with combined short movements	3	2		2	0,78
Measurement trajectory with force excitation	3	2	2		0,78

Results

	Economic efficiency	Data quality	Overall
Production trajectory	4,00	1,56	5,56
Measurement trajectory with isolated long movements	2,11	3,56	5,67
Measurement trajectory with combined short movements	2,44	2,78	5,22
Measurement trajectory with force excitation	2,11	2,78	4,89