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A Technological and Economic Potential Analysis of Measurement Systems in Geometrical Quality Assurance

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Abstract

Geometric quality assurance plays a key role in the competitiveness of manufacturing companies. Besides the inspection of sheet metal parts with sufficient accuracy, aspects such as automation, measuring speed, reduction of manual tasks, and the required know-how are also considered important factors when investing in new systems. Based on existing approaches, we introduce a methodology adapted for the assessment of the technological and economic potential of measurement systems. By means of an empirical expert study, we collected a database for determining and comparing the potential of four different measurement systems: a coordinate measuring machine, two robot-based optical inspection systems with a photogrammetry-based approach and one with a laser tracker, as well as a measurement concept suggesting the application of region-specific reference projections and subsequent data-driven registration. This paper presents the results of the potential analysis as well as the assessment of experts regarding the proposed measurement concept.

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