Transformation of Data Points Taken from Different Coordinate Measuring Systems under the Influence of Measuring Error

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ABSTRACT

In many 3D designs computer models cannot be completed in once due to the vast artifact volume and the measuring limitation of digitizing machine. To accommodate the shortage of that, in this research RHINO and Microscribe are combined to digitize the artifacts of human head and hand in a section-by-section measurements; afterwards a coordinate measurements transformation is applied and put all the measurements from all sections into one common coordinate system. It then followed by taking the characteristics points in the artifacts and their counterparts in the computer model. A distance matrix is formed among the characteristics points for these two (original artifact and computer model) and the difference between the matrices is extracted thereby a signal-to-noise ratio, SN ratio, is used as a criterion to evaluate the match between them. A study on the relationship between the SN ratios and the number of characteristics points is also investigated.

Keywords : RHINO ; MicroScribe ; rotation and section-by-section measurement ; SN ratio

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