Deformation Monitoring: an Assessment of Intensity Values from Terrestrial Laser Scanner in Determining Structural Damage

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SUMMARY

Different surveying techniques have been used over the years in deformation monitoring, but these methods have been limited to few data set in a sense that not much information is acquired on the entire surface of the object of interest. The aim of this research is to perform structural health monitoring on a building façade using point cloud from the terrestrial lasers scanner and to assess how best point cloud intensity values can be used to define different surface materials and also how best intensity values can detect structural damages on these facades for maintenance purposes. Scan data of a brick wall and old building were cleaned in cyclone register360 and imported into cloud compare software. The comparison map tool in Cloud Compare software was used to generate cloud to mesh distances and these differences were compared to intensity values. The magnitude of these values was determined on 3-dimensional plots. The intensity values were found to be larger than that of the Cloud to mesh values and the cloud to mesh distances were able to detect deformations on the building façade. Also, from the test case, error accumulates when two or more scans are put together.