

Terrestrial Laser Scanning for the Application of Dam Deformation Monitoring

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ABSTRACT:

Terrestrial laser scanning is gaining an increased interesting recently years due to the available of high density and real time point clouds. It can be applied to dam monitoring work. For long range measurement, atmospheric and object related influence factors should be considered carefully, especially for the high accuracy deformation monitoring work. A combined mathematical model was built for the registration of different scanner stations and their corresponding calibration factors. Singular value decomposition method and the combined mathematical model were compared for the derivative of transformation parameters. Then all the point clouds in one epoch were estimated by quadratic form model. Deformation analysis was achieved by representing points from the point clouds. with the help of proper initial values, Iterative closest point algorithm was exercised for the matching of point clouds. The terrestrial laser scanning technology was applied in the Harz dam monitoring work for the acquisition of different epochs data.