

Digital Transformation Bridge Inspection Platform With Ai, Uav, Mr, And Sfm For An Advance Structural Health Monitoring

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Vision based Structural health monitoring of bridges is a vital part of early damage detection which needs to be done proactively. The periodical bridge inspection has a difficulty to track the deterioration and maintenance progress due to large volume of data. In addition to that, the traditional inspection method requires a lot of skilled workers, equipment's, and time. Therefore, a digitalized and advanced bridge data management approach was proposed in this research with the capability to store the generated bridge 3D model data with the segmented damages using deep learning, SfM, and MR platform which will serves as a time capsule to ease the maintenance monitoring progress and to monitor the deterioration through time. The use of UAV for a fast frequent bridge patrol with flight path optimization was also proposed. Overall, the integration of the four different methods was the proposed framework of this study, which aims to significantly revolutionized and improved the traditional way of bridge inspection, and helped to make it faster, reduce the cost, solve the insufficient skilled manpower problem, and make the process paperless and digitized. The proposed framework will enable the engineers to view and collaborate in a virtual environment which the possibilities of ideas are endless without the risk of cost.