



Developing Digital Image Techniques with Low-Cost Unmanned Mobile to Monitor the Safety of Dam and Affiliated Structure

Wen-Pei Sung (1) and Ming-Hsiang Shih (2)

(1) Taiwan, Province Of China (drwpsung@gmail.com), (2) Taiwan, Province Of China

Global warming phenomena are increasingly serious, the El Niño and La Niña continue to occur repeatedly, causing the irregular drought and flood problem repeatedly. Mountain form of Taiwan is steep and storage ability of rainwater is insufficient to supply the livelihood of people and usage of industry which need to rely on rainwater reservoir. Thus, to ensure the water supply and self-reliance energy supply, one of ways to keep water resource is to build reservoir. Nevertheless, Taiwan is located on Pacific seismic belt; additionally, geological conditions are not fine, over-developed in the hills lead to more natural disasters in the future. Thus, strong shakes and typhoons which caused a degree of severe landslides around dam lead to reduce catchment of dam to result in affecting the safety of dam. Otherwise, the cracks and rusts in dam, induced by the defects of material, bad construction and seismic excitation respectively, thus, the mechanics phenomena of dam and its affiliated structures with crack are probing into the cause of stress concentration, induced high crack increase rate, affect the safety and usage of dam. This research is aimed at the safety evaluation technique of dam and its affiliated structures to develop three dimensional digital image correlation techniques for monitoring the safety of dam and its affiliated structures. Namely, developing the unmanned mobile on two axis of digital image correlation method is to detect the digital images from geometric scanning techniques for dam structure. This developed technique combined with Unmanned Aerial Vehicle (UAV) to develop the near filed scanning and monitoring techniques for local deformation and cracks on dam and its affiliated structures.