ICT Virtual Organization of ASEAN Institutes and NICT
ASEAN IVO Forum 2016
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Submission and Registration Form

I. Title—Title of presentation:

Analyzing Damage region of 3D Historic Pagodas Images after the Earthquake

II. Author(s)—Full name (First name family name):

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IV. Topic selection: Smart Society: ICT applications for community and environment
Disaster Mitigation

IV. Abstract:

Analyzing the damage area is the critical task for recovery and reconstruction for the smart city area the disaster. Traditional building damage detection method focus on 2D changes detection (i.e., those only in image appearance), whereas the 2D information delivered by the images is often not sufficient and accurate when dealing with building damage detection.

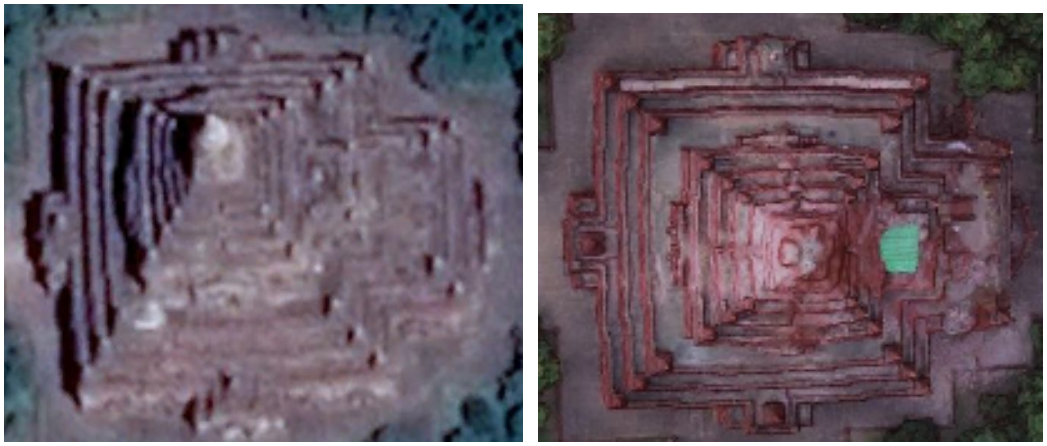
On 24th August, 2016, 6.8 magnitude earthquake struck at Bagan, the historic city of Myanmar. The figure 1 shows the map of Bagan. The aims of the project is analyzing the damage area of the ancient pagodas for providing the preserving the culture heritage in ancient city Bagan after the earthquake. The Unnamed Aerial Vehicle (UAV) is applied for data acquisition. Many existing change detection approaches are investigated the changes in two dimensional images of pre and post impact of disaster.

In the impact of earthquake, the building and pagoda are cracked or damaged only the part of building and it is not quite disappear from earth. By using the two dimensional images, the accuracy of change detection would not be good. In our approach, the changes will be computed by reconstructed 3D maps of before and after of earthquake. The pre-earthquake 3D images are obtained from google earth and some 3D pagoda images are generated from the google earth images.

The pre and post 3D images and their point cloud are used to estimate the damaging area. Figure 2 shows pre and post 3D images from Google earth. Then geo-referencing and registration process is performed to eliminate the shifting errors. After registration, the damaged area is calculated by using the change detection technique, slow feature analysis (SFA). The proposed approach is encouraging for automatic detection of damaged buildings and it is a time saving method for monitoring the building after the disaster happened in the urban region of the smart city.

Figure 1 : Map of Bagan

Pagoda image of Before and After Earthquake



(a) Pre-earthquake 3D image

(b) Post-earthquake 3D image

Figure 2: Sulamuni Pagoda,

V. Speaker information:

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