Historical analysis of the land movement in landslide area using elastic image registration and conditional statement approach.

ABSTRACT

Temporal amount of land movement is one of the important input parameter in a study of landslide detection and prediction. Automatic approach in monitoring this movement is needed to replace conventional ground surveying technique which is time consuming. An elastic image registration and change-unchanged conditional statements procedure appropriate for historical analysis of the land movement in landslide area is presented herein. Four deformation operators were used during the registration process. The similarity between two images was measured by a similarity function which takes into consideration the value of mutual information, geometric deformation and maximum overlapping area between the two images. Landslide areas were detected using the amount of pixel movement during a registration process. Two stages of four change-unchanged conditional statements had been developed to monitor landslides of future years. These conditional statements made used of the sequence of detected change images as the input parameter. It was shown that the size of pixel movement can be used to detect changes in landslide areas. The more sequences of changed images were used, the more information about the history of the area can be gathered.