

# Center of Gravity Method for Finding Center of Laser Beam Projection on Landslide Measurement

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## Abstract

### Abstract:

Landslides have caused many casualties and property. High rainfall is a major cause of soil slip. Landslides will usually be preceded by creeping soil movements. Several types of ground motion detectors including inclinometers have been used to detect this state. Proposed method is using laser beam and camera as detector of landslide. As for the benefits for science is the development of monitoring methods using laser light which is very rare or even done so far. Signals in the form of laser beam projection images captured from the camera are sent using the internet network. The image will be processed so that it can be compared with images taken previously. Changes in laser point indicate ground shift. The accuracy of determining the point of the laser beam that spreads when it is received on the target board is corrected using the cluster center method. In addition, the placement of the control plate will make the direction of the laser beam always towards the target plate. The

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## Metrics

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### I. Introduction

For developing countries, the problem of disaster is one of the obstacles in improving the quality of human resources, given that growth should not be impeded. several types of disasters have made people move from one place to another. less popular disaster but has quite a lot of events is the movement of land that causes landslides. in the tropics, the landslide disaster is ranked third. the physical magnitude of the cause of the landslide can be scientifically measured and can be well predicted. Land shifting occurs a lot and is a complex event and depends on many factors which are sometimes difficult to predict beforehand. It is necessary to breakthrough technologies so that disaster prevention can be improved. With the use of information and communication technology that is efficient and efficient a reliable and efficient system can be obtained. The limited amount of power can be overcome with a simple but efficient telemetry model. An example is using a power on Ethernet system to power an equipment. We need equipment to read soil conditions to be sent to data centers in different places, so that the analysis can be done without having to monitor every period at the ground movement location. in measuring ground motion, the instrument inclinometer is one of the tools often used to measure ground motion and the results are considered accurate. its small dimensions, high sensitivity and accuracy, low power supply, and low cost are the main reasons for using this equipment [1]. But the actual inclinometer can only detect the slope of the land, but it cannot accurately measure the amount of ground shift, in this case horizontal shift. In areas where the land is moving, the change in the slope of the land, but the value of the shift to the starting point cannot be determined. To measure or relevant equipment to measure the amount of land movement in a certain period of time in the horizontal direction. Data about ground movement conditions that can be sent to the monitoring center are signals from translation positions that can be read from sensors mounted near the target plate. The shift signal captured by the sensor can be stored and sent periodically or continuously, according to the required period, or the speed of the ground crawl. The disaster telemetry system with the proposed model is very necessary which can be made at a low cost. The purpose of this research is to produce a telemetry system to monitor ground shifts at low speeds with high quality, but high quality middle-aged soil. in addition, to obtain sensor design methods and telemetry systems for the purpose of monitoring land shifts that are slow moving. The effect is quite significant for the community is in the form of information about the condition of the land that moves, so they can anticipate in advance. It is expected that the output of this

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