

## **ABSTRACT**

*The threat of landslides often occurs during the rainy season in Indonesia because Indonesia has many hilly and mountainous areas. Landslides often have a negative impact on humans. To minimize the impact of material losses and casualties, a landslide monitoring system was developed using uRAD radar which is effective for detecting the movement of landslide slopes.*

*This study focuses on designing a system for landslide detection using uRAD based on FMCW radar and a miniature landslide which is used as a simulation of the occurrence of landslides when collecting datasets. The data obtained from the uRAD radar will be processed using Python programming in the signal processing process, this signal processing is carried out on the Raspberry Pi to run the remove DC component, FFT, remove clutter, cropping data, look for peak spectrum index, look for index mode, detect phase, and CPD. To test the detection results of the data using the CPD method to get the movement detection time by the system and use probability to determine system detection errors.*

*The purpose of this study is to obtain the results of the detection time from the CPD method used to determine the wrong detection. The CPD time is obtained from the search for the point of change in the value of the phase data obtained, using a threshold value of 1. This study succeeded in meeting the proposed objectives and the system succeeded in detecting the time when there was a small movement detected by the radar. The average result of testing the CPD method using the probability density function produces a false negative of 31.9% and an average of 4.5% false positive. This shows that the use of false alarms with PDF which is carried out to test CPD data is not good enough in processing phase detection data due to various factors.*

**Keywords:** *Landslide, FMCW Radar, Phase-Detection, CPD*