## ABSTRACT

Indonesia is a country that frequently experiences earthquakes because it is located between the three meeting paths of the earth's plates and is surrounded by many active volcanoes. Seeing these risks, an earthquake warning system is needed because it can provide warnings to the public at the beginning of an earthquake to minimize the impact. There have been many studies regarding earthquake warnings, but the information cannot be conveyed quickly to the public without an internet connection. In this final project, an earthquake warning system is created to classify vibrations caused by earthquakes and non-earthquakes using the Artificial Neural Network algorithm. This device is also designed using Long Range (LoRa) connectivity. The classification results will be sent to Antares, the IoT Platform.

The results of this Final Project show that the use of the Artificial Neural Network algorithm with input layer hyperparameters uses the "sigmoid" activation function, uses three hidden layers with each "tanh" activation function, and uses the output layer with the "sigmoid" activation function. The training accuracy value obtained is 95.12%, and the validation accuracy value is 94.10%. The best models are implemented on the device for which they are made. The results of the implementation of the model obtained an accuracy value of 86.67%. Classification results are sent using LoRa connectivity. The LoRa test results have an average delay value of 0.093 seconds, the average RSSI is -83.1 dBm, and the average SNR value is 10.59 dB.



**Keywords:** Earthquake, Artificial Neural Network, Feature Extraction, Akselerometer ADXL345, Long Range.