ABSTRACT

Earthquake is an event that the ground is shaking due to the movement of rock layers on the earth that suddenly moves towards tectonic plates. Earthquakes generally produce P waves, S waves, and Surface waves. P waves generally have a smaller amplitude and greater speed than the next two waves which can cause extensive damage. For Earthquake Early Warning (EEW), the magnitude must be estimated early enough so that warnings can be issued before the arrival of more destructive waves (S waves and Surface Waves). The purpose of this study is to produce earthquake magnitude estimation from seismic signals using Backpropagation ANN method and find out its performance.

Seismic signals are used as input data and enter into feature extraction calculations. Output from feature extraction will be input for ANN. Furthermore, ANN will conduct training to produce a weight value that produces the smallest error and the weight value will be used in the testing process which will produce an estimated value.

The best performance of earthquake magnitude estimation system is obtained with 16 feature values, 11 number of hidden neurons and learning rate value 0.4 with the results of MSE value performance 0.369060.

Keywords: *Magnitude, Earthquake, Seismic Signal, Backpropagtion ANN.*