ABSTRACT

Excessive alcohol consumption is a universal mental illness in the world, and deaths from alcohol intoxication due to excessive alcohol consumption are common. According to the WHO Global status report on alcohol and health 2018, harmful use of alcohol resulted in 3.3 million deaths worldwide, accounting for about 5.9% of total global deaths. The prolonged impact of alcohol abuse can cause damage to many organs, such as the liver, gallbladder, and heart muscle, as well as cause permanent damage to the nervous system, resulting in mental health problems and memory loss. Brain activity can be recorded using an EEG. Electroencephalography (EEG) is a powerful and popular technique for measuring brain activity by providing visuals of brain waves. It is currently proven that EEG signals can be used as a diagnostic tool in the evaluation of subjects with alcoholism.

In this Final Project research, an Alcoholic EEG signal classification system with Machine Learning is made. The design starts from converting 64x256 matrix data into gray image data (Grayscale), secondly, image quality improvement is carried out using the Contrast Stretching feature on gray image data. third, feature extraction is carried out using the Gray-Level Difference Matrix (GLDM) feature with 5 characteristic parameters, such as Gradient Contrast (GC), Gradient Entropy, Gradient Angular Second Moment (ASM), Gradient Mean (GM), and Inverse-Different Moment (IDM), 4 angular intervals of 0 °, 45 °, 90 °, 135 ° at a distance of d = 1. In the final process, classification is performed using Random Forest and Support Vector Machine methods to obtain the accuracy value.

The test results of this final project obtained the highest Random Forest accuracy value obtained by 72.5% in scenario 3 at an angle interval of 45 ° using image data that has been done image enhancement. The highest Support Vector Machine accuracy value is obtained by 72.08% in the first scenario with the Gradient Entropy parameter feature at all angles of the angle interval using image data that has been image enhanced and the second scenario with the Gradient Entropy parameter feature using image data that has been image enhanced. The

conclusion of this research is that the Random Forest classification model can provide higher accuracy results than the Support Vector Machine, and image quality enhancement using Contrast Stretching does not guarantee to provide a higher accuracy value.

Keywords — *Electroencephalography (EEG), Grey-Level Difference Matrix (GLDM), Contrast Stretching, Random Forest, Support Vector Machine.*