

ABSTRACT

The development of communication technology allows human needs to exchange ideas, opinions, and relationships between people remains good and harmonious. However, people with physical disabilities are people who suffer from motoric nerve cell paralysis such as Amyotrophic Lateral Sclerosis (ALS), which causes nerve cells in the brain not to work with human commands so that the organs of the body experience paralysis in the muscles. Using an electrooculogram (EOG) signal can improve patient communication that can irritate his eyes.

This final project, a system to control the movement of a mouse cursor in a laptop device will be implemented using EOG. Eye movements can be used as a Human Computer Interface (HCI) system which is used as a drive for mouse cursor with signals (EOG). In the EOG signal generated from eye movements will be processed by designing a device consisting of 3rd order amplifiers and filters, which are processed using microcontollers with the ADC process and will be received by the computer using USB. The method used in this final project is continuous wavelet transform and classification using K-Nearest Neighbors to determine the movement of the mouse cursor direction with the number of data samples as much as 55 training images and 55 test images with 8 classes of movement patterns up, top right, top left, bottom, bottom right, bottom left, right, left.

This final project research is a system that is able to accurately control mouse cursor movements based on EOG signal characteristics, using 74.1% accuracy parameters with a computing time of 3.2154 seconds. It is hoped that with the ability of this system, it can help in the field of biomedical health for people with ALS.

Key: Electrooculogram (EOG), Human computer interface (HCI), ALS, mouse cursor control system. Key: Electrooculogram (EOG), Human computer interface (HCI), ALS, mouse cursor control system.