ABSTRACT

The devices supporting interactions between computer and human currently are limited in physical interface which receiving input in the form of direct action that encounter the device, therefore it is necessary to conduct research about biological signals reading and processing it so that interactions between computer and human can be more convenient. In the prior research, controlling pointer position using eye movement has been implemented. However, this technique has deficiency of unable to perform more varied commands such as scroll, drag, and zoom. Another alternative solution that can be done is to use hand gestures.

By doing a certain hand gesture, pointer will perform an assigned command. In example, pinch gesture will order pointer to perform left click command. The performed hand gesture can be recognized by reading electromyography (EMG) signal at arm. This signal later will be processed so it can be understood by computer. Moreover, detecting arm movement direction and orientation also need to be done to complete it so an Inertial Measurement Unit (IMU) is needed. The next thing to do is integrate them to a wearable device so it is more easily used. The intention is pointer move according to hand direction and implement various command according to certain hand gestures.

In this thesis a device to detects EMG signals at arm and classifies hand gestures will be built. Hand gesture classification is processed by implementing Linear Discriminant Analysis machine learning method. According to the examination results, the system built in this thesis managed to classify signals in 76,25% accuracy.

Keywords : *electromyography, EMG armband, gesture recognition, IMU, dry SEMG, wearable devices*