

## **Abstract**

**Nowadays, many people have developed a fall detection system, falling detection is a wearable sensor which is used to help the elderly so it is safe to carry out daily activities. The fall detection system is based on accelerometer and gyroscope using Wavelet and HFD methods for feature extraction and K-Nearest Neighbor (KNN) algorithm for classification. This final project is aimed to find the best level accuracy of the elderly with healthy adult comparison. The level of accuracy is obtained by comparing methods on feature extraction using the Wavelet and HFD methods. A tool consisting of an sensor-based ESP32 microcontroller MPU-6050 (accelerometer and gyroscope sensor) will test 3 activities from the Daily Life Activity (ADL), i.e walking, sitting-up and up-sitting. Data obtained from the tool will be classified to recognize the ADL that was performed. The results obtained were both of feature extraction methods capable of issuing accuracy values with the KNN classification algorithm with a value of 80% for the HFD method and 71% for Wavelet. HFD is the best method for classification of ADL activity.**

**Keywords: ADL, Feature extraction, KNN**