

ABSTRACT

Heel pain is a common pain that occurs in the foot which produces painful sensation around the heel. The cause of heel pain emergencies are from various reasons such as foot's weight-sustainability, foot posture type, even from too much standing or running.

Heel pain location can be a reference for a first diagnosis that can be done before seeing the doctor to determine which kind of heel pain the person has. This first diagnosis is possible to be done by implementate an Electromyography (EMG) that is placed in a various location points on the foot.

This research implementate an EMG as a sensor for signal acquisition towards muscle activities in posterior and midfoot of neutral and pronated foot with 60 seconds acquisition time in before and after activity of up and down the stairs for 15 minutes. The read results of muscle activities from EMG were measured using seven time domain feature extractions (IEMG, MAV, MAV1, MAV2, SSI, VAR, RMS) to see the increase of feature value from before and after activity. The feature result was correlated with before and after class which then taken one features with best correlation score. The result obtained that MAV1 was the most sensitive feature to determine the heel pain location between both locations. MAV1 feature was tested to 9 additional subjets and as a result, there are 8 subjects consist of 7 neutral foot and 1 pronated foot felt pain on midfoot and 1 neutral foot subject felt pain on posterior. Based on the measurement test, difference percentage range of MAV1 feature from before to after activity of all nine subjects on midfoot was between 10.19% - 57.02% and posterior was between 0.79% - 36.34%.

Keywords: Electromyography (EMG), Feature Extraction, Heel Pain, Foot Posture, Correlation