DESIGNING AND DEVELOPING AN INTEGRATED SYSTEM OF ELECTROMYOGRAPHY USING ANT PROTOCOL

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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The main objective of this thesis is to develop a system in which the user can measure, analyse, and monitor muscle activity, focusing on electromyography (EMG) as a sensor for analysing muscle and its behaviour during activity. ANT protocol will be used and applied as the communication protocol between sensors, processing unit, server, and controller. ANT protocol is the international standard wireless protocol used specifically in health and sport activities.

The system consists of hardware, which is an Arduino microcontroller for processing the sensor, a C++ based software application to process the ANT protocol library data, and Jack Human Simulation. Electromyography is used to sense muscles activity. The main problem discussed in this thesis is to create network systems, to create a system of electromyography using ANT protocol integrated into wireless network consists of a monitoring system and simulation platform. The theory behind the project is as the muscle contracts, it creates electrical pulses, which later will be used as the main input data for this thesis work. All the experimental results will be used to demonstrate the interaction of the whole network systems.

Keywords: Electromyography, ANT, EMG, ANT protocol, Jack Human Simulation.

DEDICATION

I dedicate this thesis to the Almighty God, my parents, my beloved friends, and my alma mater.

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