M S Ramaiah Institute of Technology

(An Autonomous Institute, Affiliated to VTU)

MSR Nagar, MSRIT post, Bangalore-54

A Dissertation Report on

Android Based Monitoring Human Knee Joint Movement Using Wearable Computing

Submitted by

Sanjana K.S	1MS12CS098
Vidit Jain	1MS12CS127
Vignesh P	1MS12CS128
Vishal H	1MS12CS132

In partial fulfillment for the award of the degree of

Bachelor of Engineering in Computer Science & Engineering

Under the guidance of

Mr. M. Mallegowda
Assistant Professor
Dept. of Computer Science & Engineering
M.S. Ramaiah Institute of Technology

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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www.msrit.edu, **2015-2016**

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Department of Computer Science & Engineering

CERTIFICATE

This is to certify that the project work titled **Android Based Monitoring Human Knee Joint Movement using Wearable Computing** is a bona fide work carried out by **Sanjana K.S (1MS12CS098), Vidit Jain (1MS12CS127), Vignesh P (1MS12CS128), and Vishal H (1MS12CS132)** in partial fulfillment for the award of degree of Bachelor of Engineering in Computer Science and Engineering during the year 2016. The Project report has been approved as it satisfies the academic requirements with respect to the project work prescribed for Bachelor of Engineering Degree. To the best of our understanding the work submitted in this report has not been submitted, in part or full, for the award of said degree.

Signature of the Guide
Mr. M. Mallegowda

Signature of the HOD
Dr. K. G Srinivasa

External Examiners

Name of the Examiners: Signature
1.
2.

DECLARATION

I Student of final semester BE, Dept. of Computer Science and Engineering, M.S. Ramaiah Institute of Technology, Bangalore, hereby declare that the project entitled **"Android Based Monitoring Human Knee Joint Movement using Wearable Computing",** thesis completed and written by me under the guidance of **Mr. M. Mallegowda,** Dept. of Computer Science and Engineering, M.S. Ramaiah Institute of Technology, Bangalore for the partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering has not been formed the basis for award of any other degree or diploma certificate.

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ABSTRACT

In today's fast moving lifestyle, incidents regarding health issues are surfacing every day. One of the major issues relating to medical concern is weakness in joints caused due to excess stress. Hence there is a demand in the market for wearable devices to measure the rapid movement of human joints when under recovery. We are developing a prototype by implementing two accelerometer sensors which is placed around the joints in order to detect the amount of stress in the knee, thereby providing the correct information to an individual's family physician. This system will be highly helpful for athletes and also for people who are recovering from a knee surgery as it ensures speedy rehabilitation since it constantly monitors the knee. It uses a Renesas RL78 microcontroller along with a HC05 Bluetooth module to communicate with the Android application where the data obtained from the sensors are graphically represented using a pie chart which displays the frequencies of different activities performed by the patient such as walking, running, etc. Whenever there is excess stress on the patient's knee due to body posture or activity performed, a voice alert is played on the android application to ensure that the patient refrains from doing that activity or changes the body posture. Also during unforeseen situations, a SMS alert is sent to the registered mobile number and an Email alert along with the location of the patient using GPS, is sent to the intended recipients. In order to make sure that the Android application occupies reasonable space, the accumulated data can be cleared once the physician has seen it.

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