AN ENERGY EFFICIENT, MINIMALLY INTRUSIVE MULTI-SENSOR INTELLIGENT SYSTEM FOR HEALTH MONITORING OF ELDERLY PEOPLE

N.Samanta[a], A.K.Chanda[b], C.RoyChaudhuri[a]

[a] Dept. of Electronics and Telecommunication Engineering

Bengal Engineering and Science University, Shibpur, Howrah -711103, West Bengal, India,

Email: chirosreepram@yahoo.com

[b] Amateur World, Regent Park, 1/6 Gandhi Colony, Regent Park, Kolkata-40, India

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Submitted: Oct.9, 2013 ***Accepted: Apr. 20, 2014*** ***Published: June 1, 2014***

Abstract- Most of the existing systems for elderly health monitoring deploy a large number of cognitive sensors including wearable sensors for physiological parameter measurement. Increasing number of sensors not only make the system power consuming and expensive but also intrusive in nature. However, there exists very limited research on power saving algorithms in such systems incorporating customer friendly features. In this paper, we report a modified health monitoring system which addresses both these issues. The central controller unit has an in-built algorithm based on two level adaptive branch prediction techniques to detect the period of inactivity of sensor nodes. Further, only one wearable heart rate sensor node is included in the system which measures the heart rate and detects abnormality. The central controller signals an alarm to the user to wear this predicting the sleeping time. This makes the system minimally intrusive and user friendly. Thus the multi-sensor network consists of motion sensor, current sensor and a wearable heart rate sensor along with a central controller unit. The prototype of the whole system has been installed in the house of elderly person and it has been observed that the time of prediction was close to the actual time for more than 90% of the days for a test period of one month. An average of 68% power saving has been achieved in the modified system.

Index terms : health monitoring, elderly people, multi-sensor system, power saving, minimally intrusive.