I-Stress: A Stress Monitoring System through the IoT

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Psychological stress can be defined as a state of emotional or mental strain due to different circumstances. It is a feel of pressure which affects the physiological parameters in a person where in the body behaves the way when it is under attack which again releases complex hormones and chemicals like adrenaline, cortisol, etc. Highly impulsive behaviors, inappropriate or extreme emotional reactions can lead to a personality disorder called borderline personality disorder (BPD). This may also lead to expensive treatments. Acute level of stress in people who are already diagnosed with borderline personality disorder or schizophrenia, can cost their lives. Managing the stress levels is the major problem. It is not easy as it affects the psychological parameters of the human body like mental and emotional disorders, depression, anxiety, panic attacks and phobias. One of the best ways to control stress is by practicing meditation which encourages to relax the mind. But monitoring stress levels when a person engages in high intensity physical activities, remain a challenge.
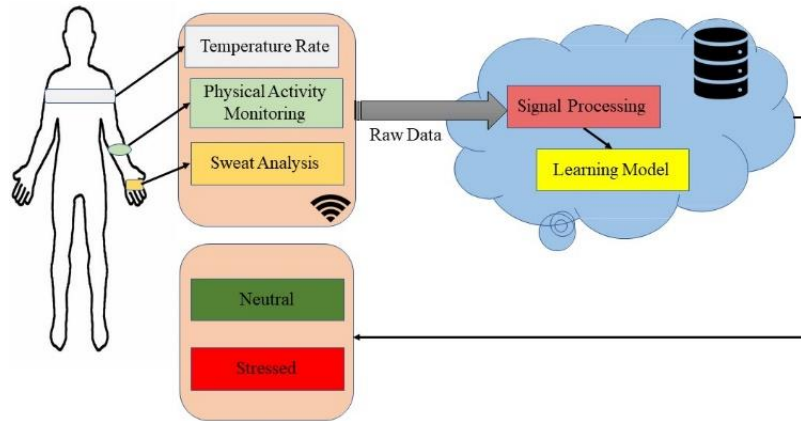

Fig. 1: Basic Architecture of I-Stress System.

In this research we propose a stress management system (Refer Fig. 1), I-Stress, which analyzes stress in a person by considering body temperature, sweat and physical activity. This proposed system helps in keeping the individual self-aware and gives feedback to change lifestyle of the person to lead a healthy life. This helps in maintaining a healthy life balance easy and warns the human before being too much affected by the negative effects of stress. The sweat of the person is taken as one of the sensor parameter as the sweat is the basic symptom for any kind of abnormality a human body has. Simple concepts have been incorporated with the sweat, the body temperature and the rate of the physical activity the person has done. Data obtained through this sensor system are wirelessly sent to a central system and a comparison of the stress levels of the person, in similar scenarios is done. Thus, the proposed system can help in monitoring stress with help of the Internet of Things (IoT).

A fuzzy based controller is used to differentiate the sensor data into 2 states: stressed and neutral. A system level design of the proposed system is prototyped in Simulink® framework. The proposed system gives an overall efficiency of 91%.