

ABSTRACT

Vital signs (VS) are the most basic measurement of body functions. These vital signs include body temperature, heart rate (HR), respiratory rate (RR), blood pressure, blood oxygen saturation (SpO₂), and GCS or AVPU scale where the first three signs sequences are the basic vital signs. Measurement of vital signs is useful for detecting or monitoring medical problems in a medical setting, at home, at a medical emergency location, or elsewhere. Measuring and recording vital signs is an important step in assessing the risk of serious illness, assisting in diagnosis, and ensuring appropriate action. Even in developed countries like in UK, hospitals have improved the quality of services by adopting protocols for measuring and recording vital signs as a standard fundamental measurement every 15 minutes for the first 2 hours. Therefore, in this final project an integrated system is designed to measure 4 vital signs of the body (temperature, RR, HR, SpO₂).

Furthermore, because these measurements are not only used in a hospital environment, but are also needed for monitoring purposes, the system is designed to be wearable so that it is easy to install and makes users more comfortable when using it. The IoT scheme is also implemented in this system for sending data from the system to the Firebase and data can also be monitored via a smartphone. The result of this project is a system called "VS wearable device", where the accuracy of temperature, HR, RR, SpO₂ measurements are 99,73%, 98,79%, 93,30%, and 99,59%, respectively. This device is able to perform VS monitoring every 15 minutes in both sleep and activity conditions, where the power requirements per hour are 0,03 watts, and throughput time is 1,2 Kb/s.

Keywords: *wearable device, vital sign, monitoring, respiratory rate, IoT.*