Development of a Miniature and Low-Cost IoT-Based Remote Health Monitoring Device

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Abstract : The modern busy world is running behind new embedded technologies based on computers and software; meanwhile, some people forget to do their health condition and regular medical check-ups. Some of them postpone medical check-ups due to a lack of time and convenience, while others skip these regular evaluations and medical examinations due to huge medical bills and hospital expenses. Engineers and medical experts have come together to give birth to a new device in the telemonitoring system capable of monitoring, checking, and evaluating the health status of the human body remotely through the internet for the needs of all kinds of people. The remote health monitoring device is a microcontroller-based embedded unit. Various types of sensors in this device are connected to the human body, and with the help of an Arduino UNO board, the required analogue data is collected from the sensors. The microcontroller on the Arduino board processes the analogue data collected in this way into digital data and transfers that information to the cloud, and stores it there, and the processed digital data is instantly displayed through the LCD attached to the machine. By accessing the cloud storage with a username and password, the concerned person's health care teams/doctors and other health staff can collect this data for the assessment and follow-up of that patient. Besides that, the family members/guardians can use and evaluate this data for awareness of the patient's current health status. Moreover, the system is connected to a Global Positioning System (GPS) module. In emergencies, the concerned team can position the patient or the person with this device. The setup continuously evaluates and transfers the data to the cloud, and also the user can prefix a normal value range for the evaluation. For example, the blood pressure normal value is universally prefixed between 80/120 mmHg. Similarly, the RHMS is also allowed to fix the range of values referred to as normal coefficients. This IoT-based miniature system (11×10×10) cm³ with a low weight of 500 gr only consumes 10 mW. This smart monitoring system is manufactured with 100 GBP, which can be used not only for health systems, it can be used for numerous other uses including aerospace and transportation sections.

Keywords : embedded technology, telemonitoring system, microcontroller, Arduino UNO, cloud storage, global positioning system, remote health monitoring system, alert system

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