

Abstract

Information Communication Technology (ICT), especially Internet of Thing (IOT), has a great impact on the improvement of quality of health services. Many IOT-based digital systems in healthcare, such as WIFI digital thermometer, Telemetry Digital Pacemaker and Remote Digital Blood Pressure, have been developed recently. The systems allow physicians in hospitals to remotely monitor the condition of patients continuously. It improves the quality of caring for the patients to be anytime and everywhere. However, most of the systems have been developed without considering energy issues. As a result, most of the systems may be suspected wasteful of energy consumption due to data transmission occurs frequently and continuously. In the other hand, research reports on the energy consumption of the systems have not been performed. It causes difficulty in obtaining data on the energy consumption of monitoring normal body temperature, a fever condition and a hypothermia from literatures. To address these issues, this research develops an IOT-based digital thermometer that is called HI-Thermo. HI-Thermo is an adaptive system that is utilized fuzzy logic to optimize the use of energy on the proposed system. Fuzzy logic saves energy by controlling the transmission interval in Hi-Thermo. Several experiments have been conducted to evaluate the performance of HI-Thermo; and rigorous data results have been analyzed from the experiments. The results show that HI-Thermo saves energy of monitoring significantly. For normal body temperature monitoring, the proposed system consumes 17.04% lower than the existing traditional monitoring of body temperature, which does not implement the fuzzy logic. In addition, in the case of fever and hypothermia monitoring, Hi-Thermo indicates 15.52% and 17.54% more energy efficient than the traditional

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