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Smart embedded-analytics sensors with cloud-based measurement system for HVAC

Absract

HVAC system is a necessary component of environment to maintain the temperature and humidity to be kept at certain levels by using air taken from outside to ensure the indoor comfort. The purpose of the study is to reduce the electricity energy usage and cost from air conditioning by using smart embedded-analytics sensors to provide the automatic thermal control in an area. In this study, we used sensors such as temperature and humidity sensors to detect and read the currently temperature and humidity of an area monitored by a microcontroller. The cloud-based system and the sensors are connected via wifi in the presence of MQTT protocol. The protocol enables publish and subscribe method which provide the communication between sensors, cloud-based system and HVAC system. This communication can serve thermal control automatically thus resulting the optimize usage of energy from air conditioning according to the external environment temperature and humidity. The control of the temperature and humidity from air conditioning can be designed through the programming embedded in the microcontroller. The monitoring result can be displayed from the control panel to ensure how the system works.