SMART HOME USING IOT

Abstract—The project discussed in this paper was targeted at developing secured and automated systems for home. Smart home service is an emerging technology in IoT and has marked changes within house equipment from being dull into being more intelligent, remote controllable and interconnected [1]. However, with this development, the system's complexity in usage as well as the cost has also increased and likewise the security issues. The major objectives of this project, Smart Home using the Internet of Things (IoT), are to remotely connect and monitor devices through the Internet, to automate the system during offline mode and to provide access inside the home via face-recognition. The part of the system was designed to unlock the door using face detection and recognition using raspberry pi and pi camera. For face detection and recognition, the Haar cascade algorithm was implemented within the raspberry pi. Raspberry pi and NodeMCU esp8266 were linked with cloud based mobile app, Blynk, an IoT platform, designed for IoT based applications. NodeMCU acted as a gateway to internet and Raspberry pi. A number of NodeMCUs were connected to sensors and devices for real-time supervision of the sensor outputs. These outputs were then sent to Blynk cloud using the internet and were made accessible to users to view, using Blynk mobile app and thus enabled the user to make decisions accordingly, to control the electrical appliances. When the user was offline, the system was designed to switch to an automated state and control the appliances automatically as per the sensor reading. The calibration of the sensor units was done to ensure better performance of the overall system. The tests performed showed around 100% accuracy in device controls and sensor readings. The latency was in the range of 2 seconds, depending highly on the internet speed. The system showed an accuracy of approximately 77% for face recognition. The results of this paper can be used to develop enhanced IoT based smart systems with more functionality for homes.

Index Terms—IoT, Face detection, Internet, Raspberry PI, NodeMCU esp8266, sensors, Blynk app