London Metropolitan University

CS7080 Cloud Computing and Internet of Things

Coursework II – Proposal

Groupwork

Automated Covid -19 Gate Pass using Temperature Monitor

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Submitted To:

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Abstract

In 2020, the world faced a new crisis in which a pandemic of an unknown virus affected all including businesses, education and the normal life around the world. A virus whose first symptoms were diagnosed with fever and high body temperature. Hence, the perceived need to control body temperature at all entrances in airports, terminals, shopping malls, schools and so on became a vital instrument. Artificial intelligence and IoT technologies have contributed significantly in implementing input control schemes such as mask detection, body temperature measurement and remote detection of early signs of the virus. An Automated Covid -19 Gate Pass provides a smart platform which regulates and control access of operation and identifies any signs of virus infection in humans. Similarly, the body temperature measurement is the key factor to meet the condition of passing the internal and external gates. This idea, inspired us to establish a new solution which monitors the body temperature using MLX90614 non-contact temperature sensor module, Pi-camera, light and packet-sized raspberry pi provide a real time status of parameters in the cloud hence controlling the gate remotely by giving permission to individuals to pass the gate. The proposed prototype, which is illustrated in this paper is practically deployed in Microsoft Azure cloud platform to send, receive and process the data provided by raspberry pi. Finally, the proposed model demonstrates an affordable automated control system.

Problem Statement:

Research has shown that the Covid-19 virus can be easily transmitted through human contacts with things. Therefore, body temperature control through contact devices can act as an accelerator factor to all the spread of the virus. Thus, there is a perceived need to enable controller user to monitor the status of all passers remotely in a cloud based platform and analyze the results to get permission to pass the gate. Also, providing a cost-effective, efficient and convenient access to influential key components to control them remotely can be a significant privilege.

Aims and Objectives:

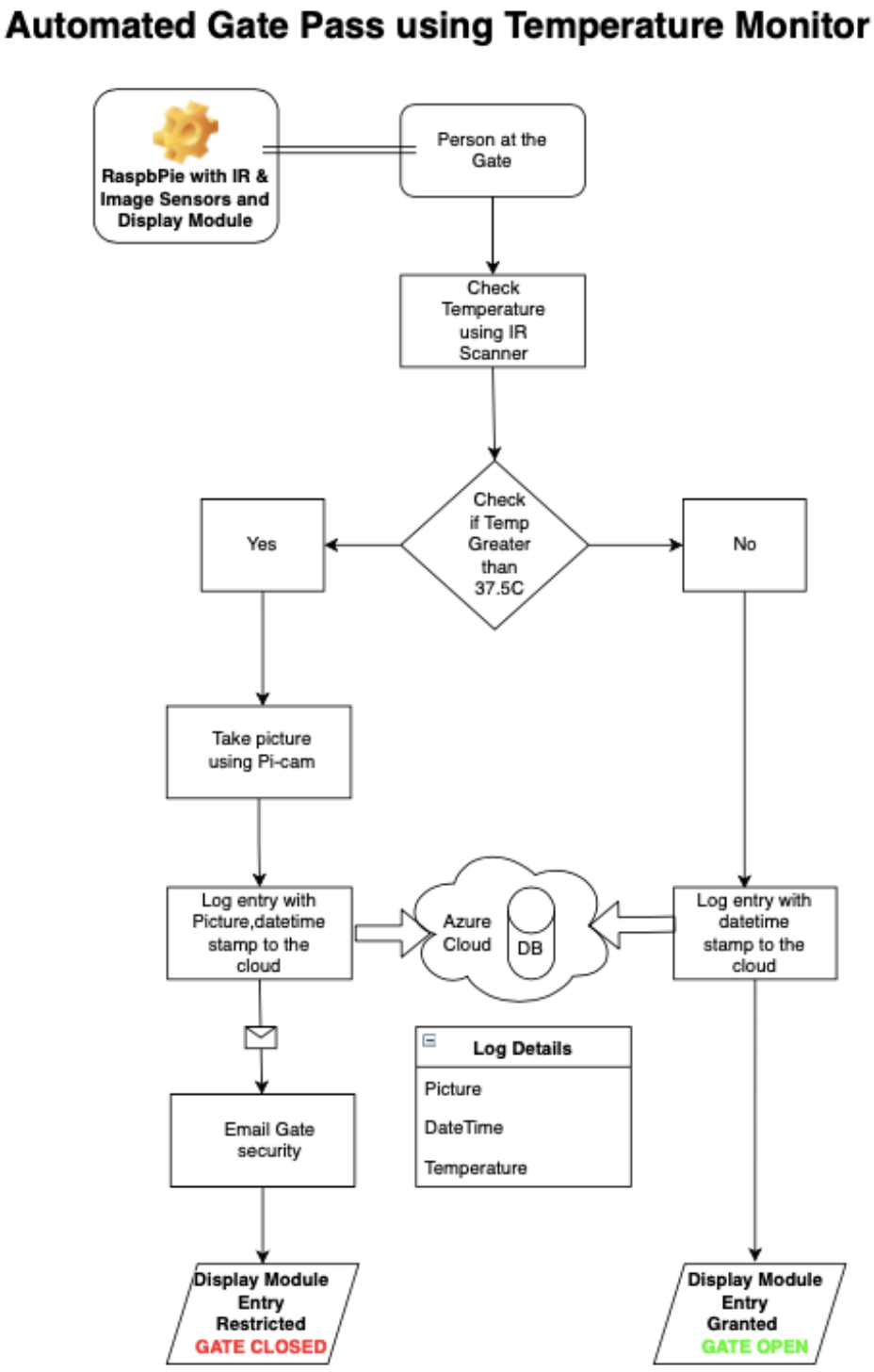
The main aim of this project is to develop a useful platform for a real time and efficient surveillance of Gate passing system using software, hardware and cloud equipment. The objectives to fulfill this aim are as follows:

- Specify a schematic model of selected prototype.
- Connect circuits and make connections between raspberry pi, MLX90614 IR Non-Contact sensor module, Pi Camera and LED to show the result of permission and PC.
- Use Python Language applying related librarries and I2C interface.
- Convert the result of program to Microsoft Azure cloud platform.
- Using SMTP protocol and Mail utils package to send an alert email with an attached image of passer with high body temperature when captured by pi-cam.
- Make an access for user via cloud to control opening and close status of gate remotely.

Scope of Project:

- Most of the methods used to monitor Covid-19 signs aren’t affordable for users, which makes users less inclined to deploy them.
- "Authentication" and "Security" are other controversial challenges in this project. Most data resulted from IoT-based devices run on open-access and cloud-based platforms which can cause easy access to information by an unauthorized user.
- Accuracy and failure rate of measurement and analysis can be highlighted as other limitation of this project.
- using SMTP as protocol can provide less security level.
- May make users distrusting the use of these technologies which can violate their security and privacy.
- Incompatibility with other systems and complexity of working systems and lack of visually appealing environment for the user.

Flowchart:


Automated Gate Pass using Temperature Monitor
RaspbPie with IR & Image Sensors and Display Module
Person at the Gate
Check Temperature using IR Scanner
Check if Temp Greater than 37.5C
Yes
No
Take picture using Pi-cam
Log entry with Picture,datetime stamp to the cloud
Azure Cloud
DB
Log entry with datetime stamp to the cloud
Log Details
Picture
DateTime
Temperature
Email Gate security
Display Module Entry Restricted GATE CLOSED
Display Module Entry Granted GATE OPEN