THERMIQUE

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Prelude:

In a situation like this global pandemic,one can get easily infected even by coming slightest closer to an infected person. In this situation, fever can be indicative of a person having the risk of being infected with COVID-19. This will help alert people to be more proactive and not allow an infected person to enter a populated working environment. In this way, we could try to stop the wide spread infection of the virus. Very important and initial challenge in the epidemic of Covid-19 is to identify more probable patients out of a crowd of people. That's when the idea of Project THERMIQUE was generated. Using thermal scanning devices with sensors, our aim is to scan a person's temperature & also a time-attendance management system for identification purpose & monitoring it in real time.

Description:

One of the most crucial parts of controlling COVID-19 is preventing it's wide-spread infection. That's why,it is necessary to identify a person with high temperature.Once identified, probable patients may be sent for more Covid-19 tests for further identification & this would lead to prevent mass infection of the virus. Our idea includes -

● The exact body temperature of the person will be recorded in real time from his facial expressions using a radiometric sensor.

● Before entry into the building, a person has to stand in front of a booth, where there is a display, a lens, and an RFID reader. The person is asked to make sure his/her face is visible in the display, which will always show a thermal heat map view of whatever is in front of the lens. When the face is aligned, they can use the RFID reader to authenticate their presence with their ID card. In the database, the ID of the person, their name, the timestamp of this event, and the facial temperature will be logged.

Features:

● Obtaining the identity and exact body temperature of every person entering through the gate in real time.

● Alerting the authority when the temperature of a person exceeds a certain threshold value.

Implementation/Technical Details:

Hardwares used :

1. Raspberry Pi
2. Flir Lepton Radiometric Thermal Imaging Camera
3. RFID USB device
4. Auxiliary display as a viewfinder

Softwares used :

1. C++ codebase, with minimalist Qt GUI
2. MySQL Database, for logging entries
3. Optional bash scripts for optimization

Future Works :

Facial detection will be done so that there is no chance of getting a false positive value from any other area of the body other than the forehead or the environment. Additionally, a neural network can be trained to detect faces from the ID booth. This data may aid in future projects as well.

Images and Video:

https://drive.google.com/drive/folders/1CTN0kFQm79e3MtYZtAhUz53U94Zgkl7_?fbclid=IwAR0zHlm_t86SWIipmFYzXnQnchZ_EtHu8pcdKc7NHNMBOtoVxde-bmwJeZ4