

Electronic Device For Early Detection Of Infection At Crowded Places

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Abstract

In the last decades, the world has undergone rapid changes including demographic explosions, population movement, increase in international trade and travel, emergence of new pathogens. To respond to this changing environment, there is a need to develop the capacities of the systems to detect, notify and respond to health risks that may constitute a threat to human health. The ongoing COVID-19 epidemic highlights the need for effective tools capable of predicting the onset of infection outbreaks at their early stages. Early warning systems are therefore an essential requirement for a robust public health emergency work. Fever is a common symptom in infectious processes. A subject with high temperature in a crowded place could become the zero subject of an outbreak. Keeping this in mind, I have designed a non-invasive low-cost electronic device that senses and displays the temperature of individuals. The prototype was made with low-cost electronic components. This electronic device will allow to monitor the temperature of individuals in crowded places. The device can be installed at busy places like train stations, schools, malls or hospitals etc. Visitors can check their temperature before they enter the site. The prototype has two sensors: a thermal sensor, and an ultrasonic distance sensor. The temperature sensors operate on a one-to-one basis. Rather than looking at a crowd of people, this setup scans one person at a time. Scanning is very fast. Every 3 seconds a temperature reading is processed and can be displayed. This allows to quickly process large groups of people. It performs the skin temperature measurement with an accuracy of $\pm 0.5^{\circ}\text{C}$. The setup measures the temperature, when a person is within less than 25cm from the sensor. Another sensor used is ultrasonic distance sensor. This sensor is used in applications where measuring distance or sensing objects are required. It has two eyes like projects in the front which forms the Ultrasonic transmitter and Receiver. The sensor works with the simple high school formula that $\text{Distance} = \text{Speed} \times \text{Time}$. This sensor in the device helps in maintaining a safe distance between two people entering the site. While entering if the distance is less than defined norms there will be buzzer thus ensuring no over crowding at point of entry. The device can be installed at the entry gates of any establishments. This is one of the tools to keep malls, businesses, schools, colleges or facilities of any kind open. The device enable the precise non-reactive, contactless recording of body temperatures and ensuring a safe distance at entry points hence, it is highly suitable from public health perspective.

Keywords

Fever, Temperature, Sensor, Distance, Detection