Chapter 12
IoT Applications for Coronavirus Industry Protection: Smart Mask and Smart Badge

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ABSTRACT

In this chapter, an overview of two IoT applications, smart badge and smart mask, are used to protect employees working in a crowded environment. The smart mask protects the wearer from inhaling very small microbes that are transmitted through the airways (such as influenza virus or coronavirus), filters the air, controls the presence of CO2, and measures the body temperature. The smart badge measures the wearer temperature. It is equipped with an SOS panic alarm for indoor and outdoor workers. By pressing the SOS button, the device communicates with pre-recorded IDs so that the victim can talk and alert the emergency services. Thanks to the GPS functionality, it is possible to precisely locate the user via a Google Map link.

INTRODUCTION

SARS-CoV-2, the virus that causes COVID-19, can be spread from person to person by droplets produced when coughing or breathing during close contact with an infected person. Infection can also occur without direct contact, when these droplets land on objects and surfaces around the infected person and the other person touches these objects or surfaces and then touches the eyes, nose or mouth. That's why it's important to stay 1 to 2 metres (3-6 feet) away from the person who is sick. Because some people do not have symptoms when they are infected with the virus, a physical distance of one to two metres should be maintained, whether the other person appears to be sick or not (Chamola, Hassija, Gupta, & Guizani, 2020).

The most common symptoms of COVID-19 are fever, cough and fatigue. Some patients may experience loss of taste or smell, conjunctivitis, headache, muscle aches, congestion, runny nose, sore throat, diarrhea, nausea or vomiting, and various types of rash. Some people become infected but have no symp-

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toms and do not feel sick. Most people (about 80%) recover from the disease without needing special care. About 1 in 6 people infected with COVID-19 become seriously ill and develop severe symptoms of COVID-19, which include difficulty or shortness of breath, confusion, loss of appetite, persistent pain or pressure in the chest, and require hospitalization. . Older people and those with underlying medical conditions such as high blood pressure, heart problems or diabetes are more susceptible to developing serious illness. People with fever, cough and difficulty breathing should seek medical attention (Henderi, Maulana, Warnars, Setiyadi & Qurrohman, 2020; Haritha, Swaroop & Mounika, 2020).

You can reduce the possibility of contracting or spreading COVID-19 by taking some of the following precautions. Keep at least 1 to 2 metres (3 to 6 feet) of physical distance between you and others, whether or not they have symptoms. Wear a mask as part of the overall public health measures to prevent the spread of COVID-19 even if you are not symptomatic or infected. For this purpose, intelligent masks are designed, whose role is to measure the temperature of the human body, filter the breathing air and control the presence of CO2 (Li, et al. 2021; Baluprithviraj, Bharathi, Chendhuran & Lokeshwaran, 2021; Rahman, et al. 2020). In the industry, and in order to protect employers from the contamination of the corona virus, badges are designed to measure the temperature of the human body and control the employers around this badge. the intelligent mask and badge communicate remotely with objects located in the same environment through the Internet of Things network (IoT) (Chandra, et al. 2019; Mikroyannidis, Domingue, Bachler & Quick, 2018; Javali & Revadigar, 2012; João, et al. 2021).

The term Internet of Things refers to the network of devices capable of collecting and sharing data with other devices on the same network, as this allows things to be detected and controlled remotely via the existing network infrastructure, which creates many opportunities for seamless integration. of computer systems in the materialist world (Garg & Dave, 2019; Gupta & Johari, 2019; Desai & Toravi, 2017).

In this chapter, an overview of the two IOT applications (smart badge and smart mask) used to protect employees working in a crowded environment. The study covers its components and its operation mode.

THE SMART BADGE

In the face of the ongoing corona virus pandemic, businesses and industries need to ensure social distancing and secure contact tracing to enable their employees to feel more confident about working in a co-located physical workplace. The ability to automate the monitoring of new security policies, while empowering employees as part of the new normality of business operations, is essential for any organization.

Whether in an office, factory or construction site, each employee can be equipped with a compact portable proximity sensor that allows easy monitoring of interactions in common areas, also working with security badges for access control and smart masks. When the sensors register that two or more people have exceeded the security limit, it alerts them with an audible or visual alarm.

System Description

By entering the company as an employee, we wear our badge and register our data with the RFID TAG, which is linked to an employee ID card. At this moment, the operating cycle of this badge begins (Figure 1).