Chapter 5
A Proposed Approach for Building a SARS-COV-2 Watch in the IoT Network

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ABSTRACT

Considering the conditions that we are living in since 2020 and the cases of death caused by covid, all the researchers of the world have participated in defending humanity from this epidemic. Like all these people, the author has thought about what she cannot reduce but to specify the number of cases in an environment thanks to this project called "SARS-COV-2 watch," and this measures the temperature of the owner and also informs him in the case of someone close to him at a distance less than one meter who is infected. The proposed SARS-COV-2 watch design consists of a case to place all components, a metal cap to conduct heat into the main temperature sensor, an LCD screen to display the temperature data, and a button to activate the temperature conversion and display it on the LCD screen. In order to inform the watch wearer that there is someone around him with high temperature, the author integrated a vibrating module. This small vibrating motor is ideal for projects with haptic feedback.

INTRODUCTION

The Covid-19 crisis has upended our healthcare systems and forced most states to rethink how they operate. Faced with saturated hospitals and emergency departments in the midst of the health crisis, telemedicine has seen a sudden interest and small success (Chakkarwar, & Tamane, 2020; Mnaoui, Najoua, & Ouajji, 2020). Indeed, several months before the health crisis and the containment measures, consultations via telemedicine, i.e. an appointment with a doctor by videoconference, represented a very marginal percentage of medical consultations. Patients preferred to travel to their doctor's office even though remote medical consultations are reimbursed by the Health Insurance (Chen, 2021; Harris, 2020). However, the health crisis has completely changed the situation. Indeed, the containment measures, the recommendations of social distancing and the overloaded hospitals encouraged the French to

resort more and more to remote consultations to prevent the risks of contamination, to allow to target more quickly the patients "at risk" and to avoid the faster circulation of the virus. (Crisostomo, Balida, & Gustilo, 2020) Connected health devices such as watches, thermometers or glucose meters are not the only levers of action for connected medicine (Garg, & Dave, 2019; Hindrayani, Fakhruddin, Prismahardi Aji, & Safitri, 2020). In fact, some more infected countries have implemented additional technologies to help health services and patients fight the Coronavirus pandemic. For example, the city of Wuhan, the first Covid-19 cluster, has implemented connected robots to distribute medicines to infected patients, helping to limit the circulation of the virus in the territory (Gawade, & Joshi, 2020; Hameed, 2021; Muladi, et al., 2020).

New technologies related to medicine and health and their development can significantly improve patient management, monitoring and treatment of diseases (Gupta & Johari, 2019; Khant, & Patel 2021; Qjidaa, et al. 2020). The Internet of Things (IOT) is one of the most used technologies to solve the problem of distance between people existing in the same place (Miladinovic, & Schefer-Wenzl, 2018; Rahim, & Iqbal, 2020).

The IoT network is used to provide an object with connectivity to the Internet to allow the feedback of information. Different communication protocols are available on the market to do this. Not all of them have the same characteristics. For companies that are getting into IoT, choosing the most suitable communication network for their uses can thus become a Chinese puzzle. They have to take into account the network coverage, the battery life of the objects, the communication distance or the service cost. Connected objects allow for real-time and on-demand tracking and identification of tools, equipment and medications. Being able to have instant information about a patient can often be decisive. IOT applications allow the user to interact with others to maintain and build relationships. For example, connected objects could automatically trigger messages to our friends to let them know what we are doing and where we are. There are also some IOT systems allowing an operator or a user to report a malfunction. If it is interesting at the end of an airport service to ask a user his level of satisfaction, it is even more useful for the improvement of the service, to allow to signal a lack of soap, paper, or a problem of smell (Saini, 2019; Saini, Agarwal, Varshney, & Gupta, 2018; Soumya, Shanmugam, Saini, & Kumar, 2020; Kumari, & Saini, 2021).

It allows to connect several existing systems in spaced locations to exchange information and measurements or to execute orders (Thepade, & Jadhav, 2020; Yadav, & Vishwakarma, 2019). Based on existing connected systems, the researchers in the technology field noticed that sensors in connected watches could potentially reveal coronavirus contamination even before the first symptoms of Covid-19 are reported (Thepade, Chaudhari, Dindorkar, & Bang, 2020). It is largely the temperature sensor that indicates whether a rise in temperature is significant enough to indicate the presence of the virus (Varun, & Nagaraj, 2021; Vishwakarma, Upadhyaya, Kumari, & Mishra, 2019). For the proposed watch, I used a temperature sensor to measure the temperature of its wearer, a GPS module to detect high temperature people around the target, and a vibrator module to alert the target of a high temperature person near him.

In this chapter, a detailed approach will be presented to cite each step in the design of this proposed watch. Also, I will describe each of the connections between the above-mentioned components and the arduino micro card, as well as the codes and software used to realize this project.

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