



# Multi-function Electric Scooter Assistant System for Seniors

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**Abstract.** Many countries are moving towards an aging society. Many elderly people live alone, and they need to take themselves. The purpose of this article is to increase the safety when elderly people ride on a scooter alone. When an accident occurs, their family can clearly know the location of the accident and can record the entire accident process. This paper uses the IFTTT (If This Then That) system. When the accident occurs, IFTTT is used to send the location to the family LINE. The family can know the location of the elderly through remotely monitor the real-time behavior of the monitored person. Therefore, they can immediately understand the situation when the accident occurs. In addition, they can also know whether the elderly is riding the scooter through the pressure sensor. It can transmit GPS location immediately and start the camera to record.

**Keywords:** IoT · Aging society · Elderly

## 1 Introduction

With the rapid growth of the elderly population, today's long-term care needs, family care responsibilities are becoming increasingly heavy. In order to build a long-term care system that meets the needs of the elderly and people with physical and mental disabilities. The current changes in the world's population structure along with the advent of an aging society have brought many problems. Many elderly people use wheelchair while go out alone since the disease and degradation. Accidents are prone to happen for elderly's inconvenient activities and their relatives unable to know that. It easily causes regrets. Many elder people use a scooter as their mobility equipment since they are inconvenient to walk. However, the scooter does not have any warning devices or driving recorders. More sensors and instant messaging are required. In this paper, we use the IFTTT system (If This Then That). When an accident occurs, IFTTT is used to send the location to the relatives' LINE application. The relatives can know the location of the elderly through the line, and remotely monitor the real-time behavior of the monitored person when the accident occurs. They can immediately realize the situation.

The also know whether the elderly are riding a scooter by using the pressure sensor in the proposed system. The proposed system can effectively determine whether the scooter has an accident and send the GPS position and start the camera to record immediately.

## 2 Related Works

Through the new concept of smart health care, this article discusses how to combine smart health care with mobile health. The literature [1] designed mobile medical system to monitor the patient's medication, and whether to use the medicine according to the doctor's order to avoid the patient's wrong medication. In the literature [2] is design a smart city to arrange many sensor devices in the city. The main goal is to make the city more intelligent, such as: smart grid, smart vehicles, etc., to effectively use public resources. In the literature [3–5], function of the smart pill box is to remind the medication if there is no medication, the elderly will be reminded to take the medicine, but the elderly's physiological information and physiological information analysis are not recorded, so that the doctor cannot understand the elderly adaptability of medication. In the literature [6], remote medical treatment carried out through the concept of the Internet of Things. It is assumed that each medicine has an RFID tag, and the elder is wearing a wearable device to detect physiological information. The elders can sense which medicine to take through the wearable device. This project uses the concept of Internet of Things to capture the elders' physiological information. This article proposes that the multifunctional elderly scooter assist system uses the Internet of Things as the basis for various accident sensing and send a message to notify the location of the car accident in real time. When the accident occurs, the camera will be activated to shoot. Whether the rider is riding on a scooter, this article carries out practical development and actual testing proves that the method of this article is feasible.

## 3 The Proposed Scheme

### 3.1 Riding Situation Determination

The proposed system's flow chart shows in the Fig. 1. Detecting whether the elderly is riding on the electric scooter is the first process in the proposed system. Next, it retrieves the data of the pressure sensor around the vehicle. If the data indicate that is under pressure and the elderly is also sitting on the scooter. It means that the accident impact is slight. If the elderly is not on the scooter and the pressure the value of the sensor is large, indicating that the impact force is large.

### 3.2 Activate the Monitor Device

In order to be able to monitor the impact of the scooter in real time, the system immediately activates the relevant photographic equipment after the sensor detects it as shown in Fig. 2. At the same time, the system will also perform GPS position detection when the system performs photo recording and GPS position detection.

The relevant information will be sent to the Line of friends and relatives. When the elderly is in good condition, he can press a button to send a message by himself to inform his relatives and friends.

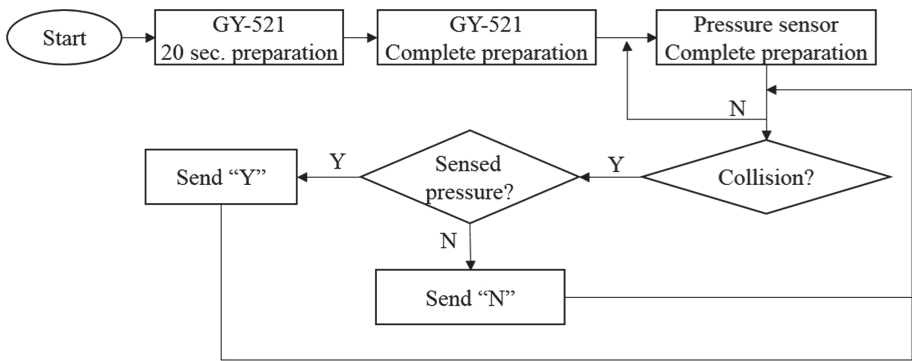


Fig. 1. Flowchart of the system

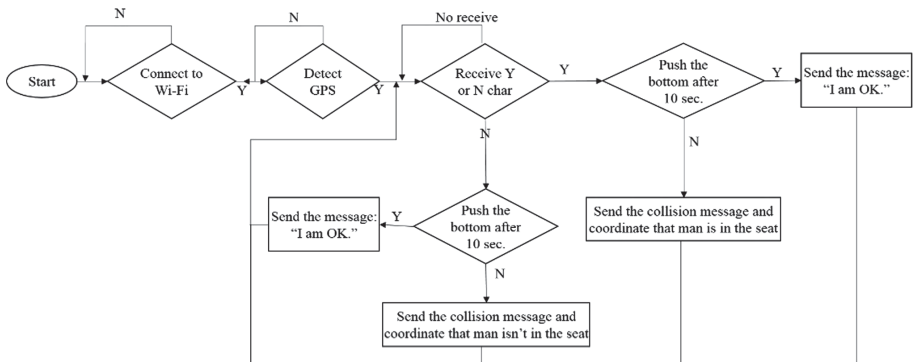


Fig. 2. Flow chart of start monitor device

## 4 Experiment Result

The experimental results of this paper are shown in Figs. 3, 4 and 5. Figure 3 is the actual experimental development version implemented in this paper. The development version is equipped with sensors and Wi-Fi communication. Figure 4 is the real-time image after collision and Fig. 5 is the instant communication transmission. The current position of elderly people can be known from the experimental results. The method proposed in this paper is feasible and can also be practically applied to scooters.

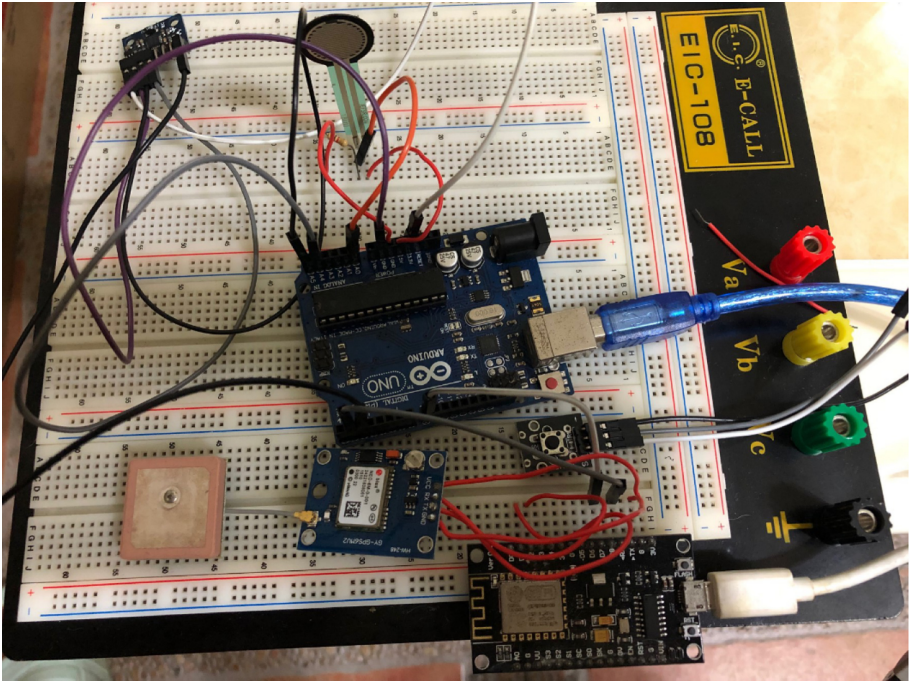


Fig. 3. Experimental development version

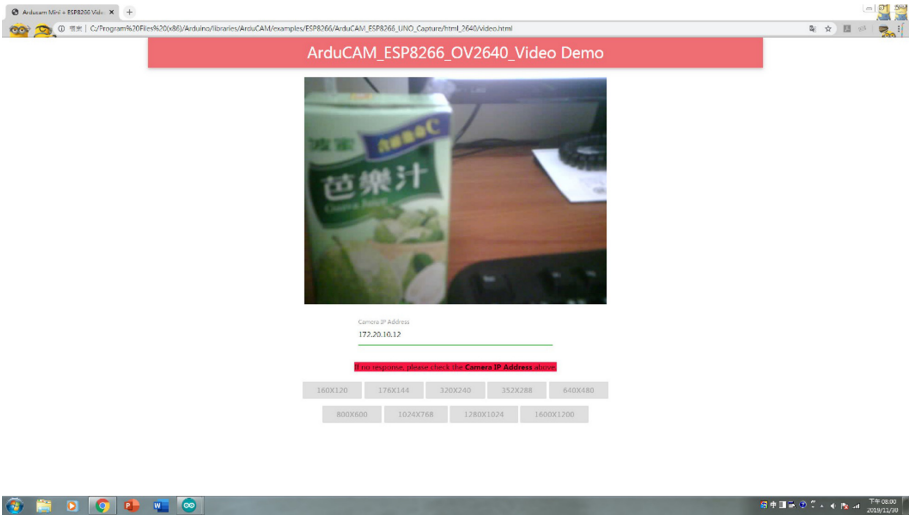


Fig. 4. Real-time image



Fig. 5. Instant messaging

## 5 Conclusion

This system can be located at the location of the accident. Due to the relationship between technology and capability, currently only the collision location can be sent during a collision, and the image processing ability is poor, so the image will be delayed; In the future, we hope that the map can be opened when the electric vehicle moves. It shows the location of the monitored person and the route they walked, so that the monitor can be seen briefly. The proposed system in this paper can be applied to the elderly scooter. It can effectively propose driving safety, and the experimental results can know that the method proposed in this article is feasible.

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