MECHATRONICS BOOK SERIES SYSTEM DESIGN AND SIGNAL PROCESSING

VOLUME 1

Editors
Asan G. A. Muthalif
Amir Akramin Shafie
Siti Fauziah Toha
Iskandar Al-Thani Mahmood

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CHAPTER 3

Intelligent Shoe Guard Systems

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3.1. Introduction

Currently, there is no shoe guard system existing in the market while shoe theft is a common phenomenon in many places such as mosque and halls. The shoe thieves cannot be caught as the crowd did not notice the appearance or act of the thief while the owner does not know when his shoes are stolen. This phenomenon occurs not only in Malaysia but other parts of the globe. Sudden rise in stealing shoes from the premises of mosques has been observed by the authors in recent time. As a result, the worshippers could not give a total focus on their prayers when they keep on thinking if their shoes will still be present at the place they left them. Furthermore, more than 40 complaints of shoes theft from mosques are received every month by various police stations in the emirate. Repeatedly, they found that their expensive shoes are stolen. This is not only problematic to the owner of the shoes but also to the mosque administration. This phenomenon showed the necessities for a shoe guard/alarm system that would minimize the probability of shoe theft and give the shoes owner some peace of mind. The Intelligent Shoe Guard/Alarm system will be automatically activated when the shoes is put inside the bag. Once the shoes are tampered with, the owner will receive a short message on their cellular phone while the alarm will sound to attract the crowd to the thief. Thereby, the owner can quickly rush to his shoes and prevent the shoes from being stolen. While the alarm sounds, the thief might have run away before it can steals the shoes. Thus the owner does not have to worry about their shoes whenever they take off their shoes before entering the mosque or other place. In addition, the system can be implemented for other portable security system to protect valuable materials as discussed in [1-2].

3.2. System Operation and Software Development

Fig. 1 shows the mode of operation for the intelligent shoe guard/ alarm system. The PIC acts as the controller of the system. There are 2 switches, 3 vibration sensors and a 3x4 keypad connected to the input port of the PIC. Two switches will be ON with the presence of shoes and automatically activate the alarm system when the shoes touch both switches. Vibration sensor acts as sensor that detects any attempt of lifting or tampering with the bag. The output caused by vibration sensors depends on the degree of tampering or vibration that is determined earlier by ANN. The output port is connected to hex inverter and a modem to send message to owner. Other output is the LED and buzzer.

The PIC will check whether the alarm system is activated or not. If it is activated, it will continuously check the input state of the sensor and switches. If any of these input is triggered, the input to PIC will be ON, thus the PIC will send signal to LED, Buzzer and GSM modem. The GSM modem will receive the data and interprets it before transmitting the data to the mobile phone [9]. The mobile phone will receive this data in the form of a short message text. The message displayed will be "Your shoes are stolen!" In addition to that, the buzzer and LED will also be activated.