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Smart elevator using facial recognition

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ABSTRACT

Identifying a person by an image has been popularized through mass media. Facial recognition is a currently used technology and has a wide range of applications. This paper presents a methodology for maintaining the security and increasing the building automation, by incorporating facial recognition in elevators. This project solves problems using the Internet of things, IoT.

Keywords— *Facial recognition, Building automation, Elevator*

1. INTRODUCTION

Archimedes made the first known elevator in 236 BC. In 1852, Otis demonstrated the first safety-based elevator and in 1857 he installed the first passenger elevator. The first residential elevator was created by Clearance Conrad in 1929. The elevator controller in its basic form.

Facial recognition is machinery able to categorize or validates a man or woman using a photo or video via video sources. Numerous ways using which these schemes work, but then again usually, it functions by associating certain features of the face from a certain photo with faces in the interior of a database. It is often designated as a Biometric type of Artificial Intelligence based submission that does usually exclusively recognize a man or woman by investigating designs according to the man's or woman's consistencies and outline on the face.

2. COMPONENTS AND FEATURES

2.1 RFID RC552

Radio Frequency Identification classification contains two chief mechanisms, a transponder devoted to an entity which has to be recognized, and a Transceiver better known as interrogator.

A Reader involves of a Radio Frequency module as well as an antenna which produces all regularity electromagnetic field. Conversely, the tag is typically a inactive device, implying that a battery is not present. In its place it comprises a microchip that goods and progressions data, and an antenna to obtain and communicate a signal. Or get the data prearranged on a tag.

2.2 Arduino

Arduino makes use of assortment of microprocessors. They are armed with groups of cardinal and similarity input as well as output pins that are to be interfaced to several extension boards or breadboards as well as certain circuits. The boards consist of a number of infrastructures interfaces, together with Universal Serial Bus on certain replicas, which are hence used for filling programs from laptops and computers. The microcontrollers are characteristically automated by the use of a cluster of features from the languages C or CPP or even python.

2.3 Python Code

Python is an understood, elevated, language of computer programming. The enterprise of python philosophy highlights code read with ease with its distinguished use of noteworthy whitespace. It's hypotheses and oriented to objects method is due to an intention to aid programmers to develop pure, rational code in different types of various projects.

2.4 Motor (Stepper type)

A stepper motor, otherwise known as motor or stepping motor is a DC motor without any brushes dividing a complete revolution into some steps. The motor's situation can thus be instructed to move as well as hold at one of the many steps deprived of any position sensor. (Controller of open loop type).

3. MODEL AND WORKING

The proposed model would be used in an elevator of a residential building. There would be a database of pictures of faces of all residents of the building, along with their respective floor numbers at which they currently reside. Once they enter the lift, their face would be scanned and recognized, and the elevator would automatically go to the desired floor (without the need to press any button). This would increase the security, as well as automation of the building as no outsider would be able to access the elevators.

For guests and visitors however (if digitally approved by a resident) the doorman of the building could give them a card that would have the data of the floor which is needed to be visited, encoded in it. The visitors could then scan the card inside the elevator and go to the desired floor. The same concept is applicable for residents who want to go to another

floor (not the one on which they reside). This has been implemented using our code in the programming language 'python' which is one of the most commonly used programming languages today and it is also open source, which means that the code could be slightly edited to serve various purposes in different buildings. As we do not have an actual elevator (due to obvious and practical purposes) we have represented the movement of elevator using a stepper motor. We have coded in python and the hardware implementation is done using an Arduino board.

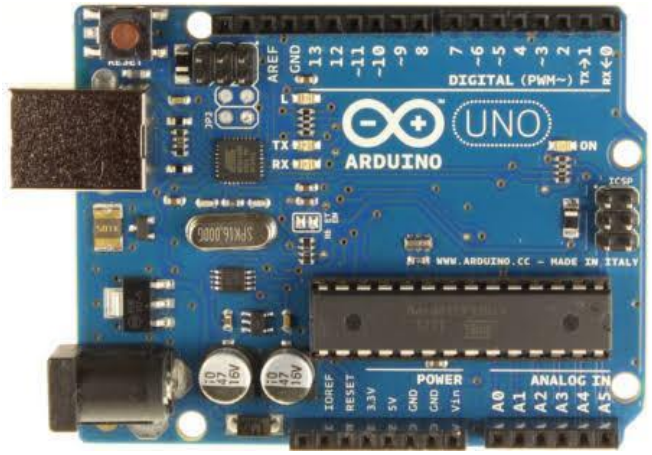

Fig. 1: Arduino board (Image)

Fig. 3: Stepper Motor (Image)

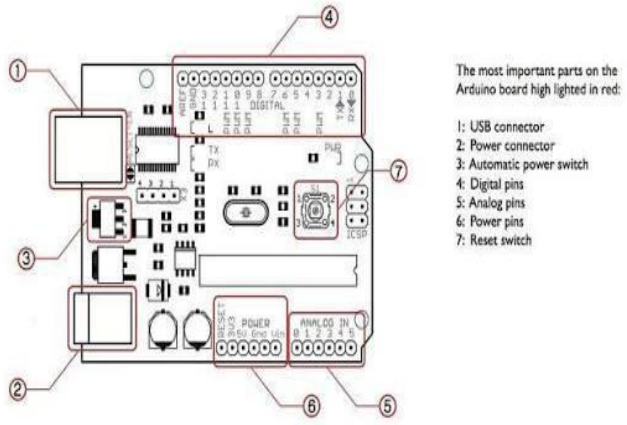

Fig. 4: Arduino board (diagram)

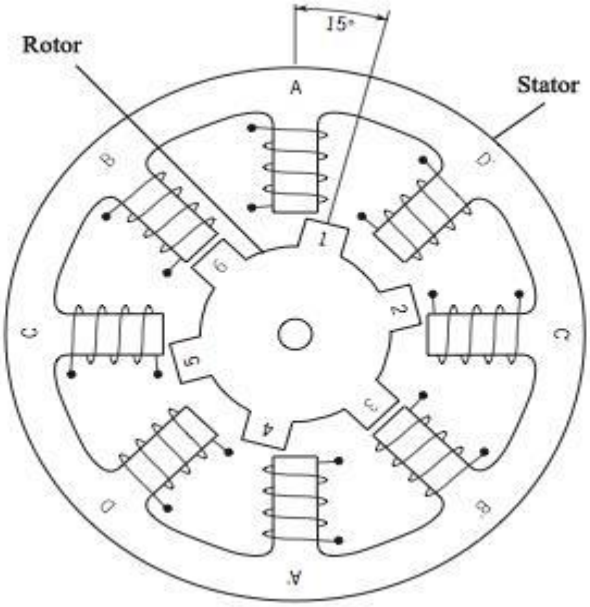

Fig. 5: Stepper Motor (diagram)

3. CONCLUSION

In this paper, we develop a computer system for allowing the access to a certain floor of a building to certain people through an elevator by a device inside the elevator car while operating it. The python code was implemented in this which helped to detect the human face at a faster rate. A RFID based card system has also been implemented in order to grant access to visitors as well as residents who wish to go to a different floor.

4. ACKNOWLEDGMENT

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