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Smart Home Based Security System for Door Access Control Using Android

Muhammad Ilmi Qolbi Imanni S. Tr. Kom, B.C s
Management & Science University, Malaysia

Dr. Rabab Alayham Abbas Helmi
Management & Science University, Malaysia

Mukhamad Angga Gumilang, S. PD., M. ENG.
Politeknik Negeri Jember, Indonesia

Abstract:

Most doors are controlled by the individual to open the door using a key, identification card, and fingerprint. The purpose of this paper is to assist users in accessing doors with automatic locks using android as a liaison and arduino as a locking device on the door. The connector used is a bluetooth chip (HC-05) which is installed on the arduino and the solenoid as a key on the door of the house. This system prioritizes security which can only be accessed by homeowners so this system is private.

Keywords: *Smart Home1, security system2, android aplication3, IOT4.*

Introduction

Currently, most of the access systems in the home area still use the usual way to access the area, in most of the home area access still uses manual keys, fingerprints, cards and many more as access control systems (ACS). Research conducted by Danny Kurnianto (2016) with the title Designing an Automatic Control System in a Smart Home Using the Arduino Uno module. The study explains that the Smart Home model is controlled centrally by the Arduino Uno microcontroller. [Kurnianto, D., et all].

Research conducted by Muhamad Muslihudin (2018) with the title Implementation of Android-Based Smart Home Applications With Arduino Microcontrollers. The concept of a smart home is a system that is intended for homes to live comfortably. This concept can be applied by arranging electronic equipment in a house. With the development of technology, homeowners can use

Android as a home controller. [Muslihudin, M., et al.]. The reason I took this literature is because the project I am working on has a relationship with this literature, which is to explain about automatic house doors using Arduino Uno which is driven by Android.

Objectives of the Study

The purpose of this study is aimed at the security system on the door of the House. This review aims to provide insight into the security system at the door of the house that can be accessed not only using manual systems but can be developed and combined with technology.

The objectives of this study include:

1. To Developing an Access Control System (ACS) using a Smart Home system in the form of a smart door that has been incorporated by the Arduino microcontroller and uses Bluetooth as the connection.
2. To provide security to the User in automatically locking the door.
3. To Provide notification to homeowners when the door is open and locked.

Methods

The methodology used to develop an android-based security system created using Agile research methodology. It is very suitable to use because it is quite effective and efficient. Based on the picture below, it can be seen the process of developing an Android-based security system.

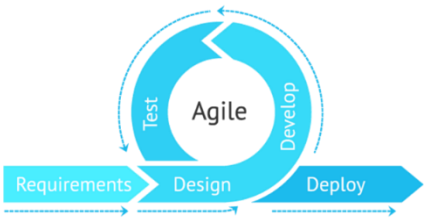

Fig.1. Agile Metods

Access Control System Based on QR Code and arduino

Most of the security systems on house door locks that exist today are manual security systems in the form of conventional keys or padlocks. Research aims to createprototype alternative security system on house keys by utilizing technology and low costs. This study uses Arduino as a solenoid driving microcontroller, and Android as Arduino controller and QR Code reader. Arduino programming using Arduino IDE.QR Code reader on Android created using App Inventor. Android and Arduino will be connected by bluetooth IEE 802.15. The testing of this research was carried out with various versions of android, namely Jelly Ban 4.1.2, Lollipop 5.0.1 and Marshmallow 6.0.1. Tests show all componentshardware and software can work well. This research resulted inSmart door lock which is cheaper than Smart door lock which are sold a lot right now.

Biometric Access Control System

Bio Metric Access Control System uses fingerprint instead of entrance card. The Access Control System not only allows entry but also provides detailed entry for individuals. The main purpose of biometrics in such applications is to recognize or verify the identity of individuals to prevent unauthorized persons from accessing protected resources. Unlike code based and password based systems or access, card systems that rely on information that was missed or things could be lost, biometric technology offers access based on who the individual is rather than what they have in their hands. In general, a biometric access control system is a pattern recognition device that collects certain categories of biometric data from individuals, focuses on the related features of the

data, compares those features with a predefined set of attributes in its database, and then performs an action depending on the accuracy of the comparison. There are a number of features that can be used for biometric comparisons, such as fingerprint, iris, hand geometry, speech patterns, or DNA records, and although there are some drawbacks to biometric capabilities, variable. (Baidya, J., Saha, T., Moyashir, R., & Palit, R., 2017).

Danalock Bluetooth Z-Lock App

The Danalock Bluetooth Z-lock App is a wireless smart lock app that lets you easily control access to your home with your smartphone. The Danalock app is used as the main control for all Danalock products. The Danalock V3 smart lock is a motorized lock that is mounted on the inside of the door and managed with a mobile phone. The smartphone app is simple and easy to use and therefore for all levels of users including beginners. It is compatible with almost all standard types of locks.

Conclusion

The purpose of using this application is to provide a security system that can be accessed from Android that can only be controlled by the occupants of the house, so that the security at the door of the house becomes more awake and not just anyone can access the door easily. In this application the features given to 2 access rights are different so that only the home owner who gets the full features can register a house member and see the history of when the door was accessed by the user. This application system is designed using the Android Studio application.

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