Control Paradox – An Automated Security System

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Abstract- **This paper presents that an automated security system for modern home, office and mall. This automation security system may be used to any enclosed place as control paradox. The implementation of automation system monitoring and controlling the security of an enclosed place through the concept of Artificial Intelligence, Internet of Things (IoT) and Android Application. This system focuses on the enclosed place to make a smart wireless automation and security system which will automates the door opening and closing and vice versa. This system can control and monitor the temperature, humidity, flame condition and all the electronic devices of the smart room or an enclosed place from anywhere in the world. This proposed method has user flexible interface and simple installation in any enclosed place. Through this technology, the user can consume the electrical power by proper monitoring system and control incidents like thefts and other kind of unusual activity. This system designed with Artificial Intelligence, IOT Based automation and Security System uses sensors with TOR network and sensors like DHT11, Ultra Sonic Sensor, PIR Sensor, Sound Sensor, IR Sensors, MQ-5 gas detection sensor, Servo Motors etc. By combining these sensors and embedded with Kali Linux platform this model will overcome the jammers. The Signals travels in TOR Network, hence it has high security and automation combines with neural network regression to predict the energy consumption to this control paradox system. Each sensor helps to separate automation and security which makes the model with high security.**

Keywords: IoT Sensors, TOR Network, Android Application, Automation & Security.

I. INTRODUCTION

The incorporation of cutting-edge automation solutions, Internet of Things (IoT), and Artificial Intelligence (AI) [1] has emerged as a critical factor in bolstering the security and effectiveness of confined spaces during an era marked by swift technological progress. With the ability to adapt to a variety of controlled environments, this article describes an automated security system intended for contemporary residences, workplaces, and shopping centers. Leveraging AI, IoT [2], and an Android application, the proposed system monitors and controls security measures in a comprehensive manner, in accordance with the control paradox concept. The main goal of this system is to establish an intelligent wireless automation and security framework that effectively oversees various operations, including automated door controls, regulation of temperature and humidity, detection of flames, and management of electronic device functionality within a specified space. It is particularly noteworthy that the system surpasses geographical limitations, allowing individuals to remotely oversee and manage their fortified areas from any location on the planet.

The user-friendly interface and uncomplicated installation process of this proposed system are critical attributes that render it suitable for deployment in diverse enclosed environments [3]. The system effectively mitigates the risk of theft and unauthorized activities while simultaneously reducing electrical power consumption through the implementation of cutting-edge technologies [5].This model implements a control paradox system by integrating AI, IoT, and an advanced sensor network. This system serves the dual purpose of bolstering security measures and efficiently forecasting and managing energy consumption. The capability of the system to forecast energy requirements is enhanced by the incorporation of neural network regression. By operating independently of one another, each sensor enhances the efficiency and security of the overall

system while also contributing to a multifaceted strategy.

Machines taking control through the help of software, robots and artificial intelligence is Control Paradox. New technology is often introduced in order to enhance our control of a certain task. This project thrives to create a High-level Automation with Security system for an enclosed place which will protect and automate using the android application, we can control the place from anywhere which the signals pass in TOR NETWORK hence the security of the system is Higher. The automation industry is experiencing substantial growth, driven by the demand for assistive systems that cater to the needs of the elderly, disabled, and individuals living alone. Consistent with this, it is verified that the global population is advancing in age. Certain home automation systems are designed for individuals in search of opulent and advanced home automation platforms, while others cater to the specific requirements of demographics such as the elderly and the disabled. A conventional wireless home automation system enables the management of household appliances through a wireless centralized control unit.

II. RELATED WORKS

The necessity for enhanced safety precautions to safeguard household appliances against potential attacks has been underscored by the substantial rise in their usage in recent years. This underscores the criticality of safeguarding household appliances against such intrusions, which could grant hackers access to sensitive customer data [6].

A demonstration was provided of a prototype and implementation of Smart Home Automation utilizing Wi-Fi technology. The ESP8266 is a Wi-Fi technology component. The system under consideration comprises both a hardware interface and a software interface. The hardware interface showcases the incorporation of ESP8266 Wi-Fi technology for the purpose of regulating home appliances and sensors. Additionally, an application is available to facilitate control for multiple household users on their smart phones, tablets, and laptops. This system is one of the most effective methods for managing energy and one of the most effective methods for controlling home devices with multiple users. The administrator grants access to the entire system exclusively to designated users. As long as the system is within Wi-Fi network coverage, it can be expanded to include sensors for home security and safety purposes, as well as the control of a variety of household appliances. [7]

III. PROPOSED SYSTEM ARCHITECTURE

Control Paradox is built with high level security and updated technologies to automate the enclosed places from incidents like thefts and other kind of unusual activities which are common these days.To overcome the above-mentioned issue, our project is designed with IOT Based automation and Security System with TOR network and sensors like DHT11, Ultra Sonic Sensor, PIR Sensor, Sound Sensor, IR Sensor, MQ-5 Sensor, Servo Motors etc. Figure 1 depicts the architecture of the proposed system. The modern home/ office or any other enclosed places that has automation system security is Control Paradox. Our system focuses on the enclosed place to make a smart wireless Automation and security system which automates including door opening and closing, etc. with Cyber security advanced technologies.

The concept of remotely connecting and monitoring physical objects (things) via the Internet is known as the Internet of Things (IoT). This idea can be appropriately applied to our home to make it safer, smarter, and more automated. The goal of this Internet of Things project is to create an intelligent wireless home security system that can optionally sound an alarm and notify the owner via the Internet in the event of a trespass.
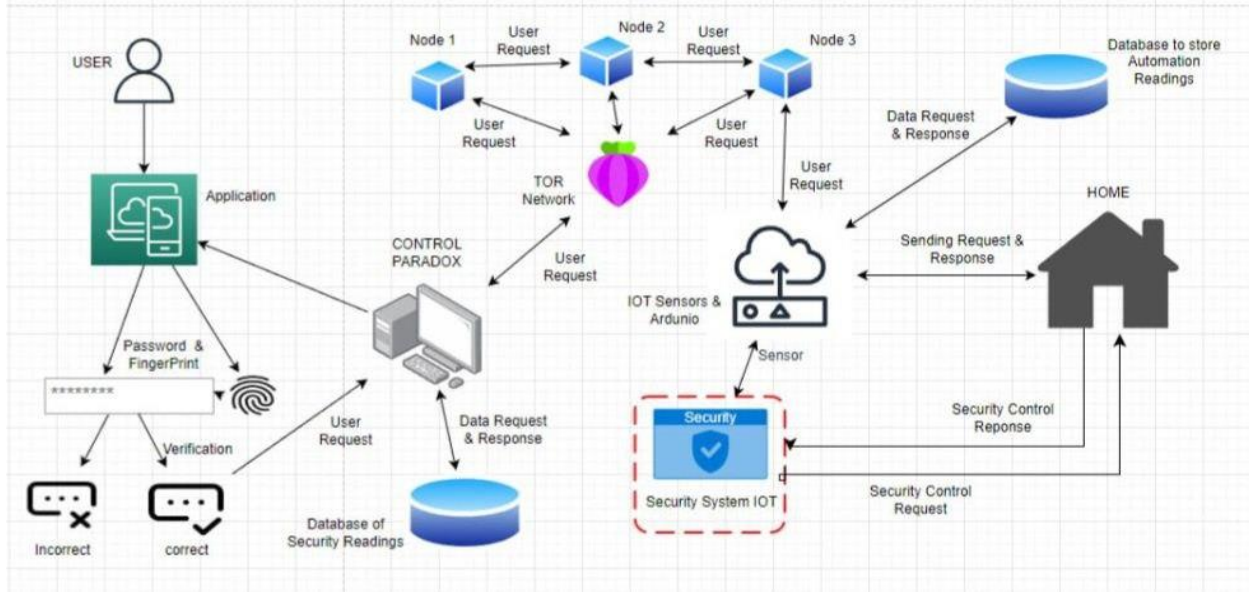
Fig 1: Architecture of the Proposed System

Workflow of Control Paradox:

The workflow of the proposed control paradox is as follows,

1) An Android application (Control Paradox) can be accessed by the user via fingerprint and password.

2) The user is then able to manage all household appliances through the provided user interface.

3) The user has the ability to activate the light through the application.

4) Information transmitted via the TOR network, which is encrypted using base 64 and XOR, will be derived from user input. Therefore, the data is protected and will be undetectable by any unauthorized individuals.

5) The data from the TOR network will be detected by sensors and stored in an additional database.

6) The monitoring of sensor security is also feasible via the Android application.

To create a High level secured and automated Controller for an enclosed place using mobile application to make the work easier and to protect the enclosed place. Control Paradox is built with high level security and updated technologies to automate the Enclosed places. Incidents like thefts and other kind of unusual activity taking place are very common these days. To avoid this our project have designed with Artificial Intelligence, IOT Based automation and Security System uses sensors with TOR (The Onion Router) network and sensors like DHT11, Ultra Sonic Sensor, PIR Sensor, Sound Sensor, IR Sensor, Servo Motors etc. By combining these sensors and embedded with Kali Linux OS the model has overcome the jammers. The Signals travels in TOR Network hence it has High Security.

TOR network has been used in signal transmit so the security will be higher. It is similar to onion network security (layered).The decentralized and privacy-conscious Tor network, which derives its name from "The Onion Router," aims to bolster safeguards and anonymity in the digital realm. Tor functions by means of a network of relays, which are servers managed by volunteers, to obfuscate the user's location and identity while aiding in the prevention of surveillance and safeguarding of user privacy. To illustrate the layered encryption utilized by Tor, the name "Onion Router" is derived. The progressive deterioration of each encryption layer hinders adversaries from discerning the source of data transmission as it traverses the network. A network surveillance and traffic analysis threatsare mitigated by this multi-layered strategy.

Fig.2: Implementation of Control Paradox

ESP8266 Node MCU and IOT sensors are used in more effective manner [8].Bar codes are used to control the system and it is also controlled using application which includes the opening and closing of doors and windows, etc. It also gives high security with the help of sound sensor. Figure 2 represents the model for the real time implementation of the control paradox. Figure 3 represents the screenshot of the android application of Control Paradox Security and Automation.
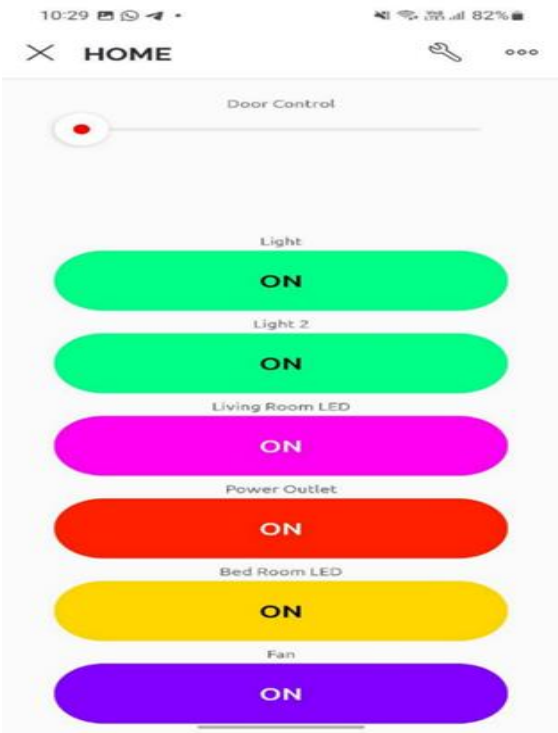

Fig.3: Implementation of Control Paradox Security & Automation Android Application

Application User-Interface has been improved with high security and more user-friendly. An android application is developed to monitor and regulate the overall appliances of the home. The sensors that are used to monitor and control the temperature, humidity, sound detection, gas level and motion detection are configured and controlled by this android application
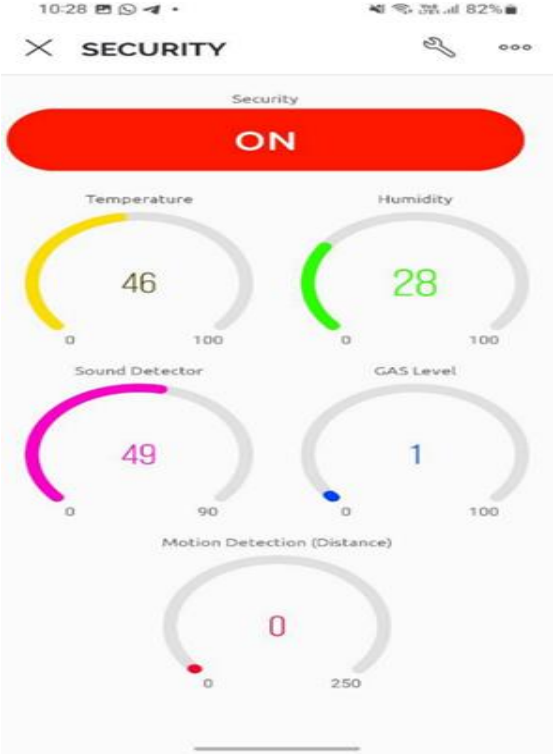
IV. CONCLUSION

The first step is to make sure your smart homes connected to the devices are all up to date in terms of software. In our project we can control our home through the devices which are connected to our application. A control paradox based on the IOT, makes the consumers life easier. In order to establish a smart automation system that is impervious to jammers and signal eavesdropping by hackers or cyber security researchers, thereby ensuring a secure and protected environment in the Internet age of the twenty-first century. That is comprised of the base module. Remote Entry: Manage your residence from a mobile device, such as a smartphone, laptop, or tablet. Security-focused Android application-based automation, User authentication via encryption.

ESP8266 WIFI system management from any location on the planet. A sense of comfort: Utilize home automation to create a more habitable and comfortable environment. Establish a consistent comfortable temperature in your home by pre-programming your thermostat with your preferred settings. Control paradox individual sensor-based coding module for security and control systems. In order to control security with servo motor automation, the ESP8266 door and window mechanisms require a minimum of three nodes in the TOR network through which the sensor signal travels. The benefit of convenience configure devices to automatically turn on at specified times, or gain remote access to their settings from any location with an Internet connection. It is possible to allocate one's attention towards more critical matters when the need to remember to lock the door or turn off the lights is eliminated.

V. FUTURE ENHANCEMENT

This Proposed model control paradox can be implemented in any kind of enclosed place so it can be automated the electronic devices presented the enclosed place with video & audio recordings. Energy Consumption can be done better in future using other components sensors. Using of new IOT sensors can improve more security. Improving the response speed of the android application with the help of control paradox system and IOT sensors. Application control of control paradox is designed in Android platform. In future IOS based application need to be developed.

REFERENCES

[1] Akhilesh, Rohit, et al. "Automated Penetration Testing Framework for Smart-Home-Based IoT Devices." Future Internet 14.10 (2022): 276

[2] Iqbal, Muhammad Azhar, et al. Enabling the internet of things: fundamentals, design and applications. John Wiley & Sons, 2020.

[3] Kundu, Diponkar, et al. "Smart home automation system using on IoT." International Journal of Scientific Engineering and Research 11.6 (2020): 697-701.

[4] Albataineh, Hisham, MaisNijim, and DivyaBollampall. "The design of a novel smart home control system using smart grid based on edge and cloud computing." 2020 IEEE 8th International Conference on Smart Energy Grid Engineering (SEGE). IEEE, 2020.

[5] Venkatraman, Sitalakshmi, Anthony Overmars, and Minh Thong. "Smart home automation—use cases of a secure and integrated voice-control system." Systems 9.4 (2021): 77.

[6] Orfanos, V. A., Kaminaris, S. D., Papageorgas, P., Piromalis, D., &Kandris, D. (2023). A Comprehensive Review of IoT Networking Technologies for Smart Home Automation Applications. *Journal of Sensor and Actuator Networks*, *12*(2), 30.

[7] Singh, Urvi, and M. A. Ansari. "Smart home automation system using Internet of Things." 2019 2nd International Conference on Power Energy, Environment and Intelligent Control (PEEIC). IEEE, 2019.

[8] A. K. Ray and A. Bagwari, "IoT based Smart home: Security Aspects and security architecture", *2020 IEEE 9th international conference on communication systems and network technologies (CSNT)*, pp. 218-222, 2020, April.