# MONITORING SYSTEM FOR OUR HOME AND ORGANIZATIONS IN ARTIFICIAL INTELLIGENCE USING CYBER SECURITY

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**ABSTRACT**: -Home Security System using Artificial Intelligence is the project undertaken to replace traditional means of security with modern IOT and A.I. based systems. Some commercial products based on image recognition are readily available, but such single security level systems can be easily breached. To overcome these drawbacks, we have implemented an A.I. based 2 level security system that can be easily scaled and can be packed with more features without loss in performance.

**KEYWORDS**: Tensorflow, Image Recognition, Voice Recognition, Spectrogram, IOT, MQTT , Artificial Intelligence, Machine Learning,.

## 1. INTRODUCTION

Home protection and family safety are the primary purposes of a home security system. While this includes detecting burglary, a security system also detects a number of other threats, including smoke, fire, carbon monoxide poisoning, and water damage. Whether you self-monitor or pay for professional monitoring, you can know if there's danger in your home, wherever you are. A professionally monitored security system will call emergency services for you if a smoke or flood sensor is activated, whether you are home, away, or asleep. It's worth noting that you have to buy the security company's equipment in order to get professional monitoring of smoke and water sensors, which is not included in standard packages and comes at an additional cost.

The market potential of all things IOT in India alone is predicted to be $9 billion by 2020. India is one of the key countries poised for largescale implementation of IOT projects - not only to be able to set new standards but also as a key geography to anticipate the emergence of a new humanism embracing people and devices.[A.I. has become a thing of magic now a days and almost every company wants to integrate a part of it in their project. A.I. gives an edge to the devices that traditional hard-coded logic can't compete with. With each passing day, overlap between IOT devices and A.I. is increasing. The combination of both, one serving as a tool for data acquisition and deployment while the later acting as a tool for computation. Applications of A.I. in IOT are endless and one of them is it use in home security. As majority of Indian homes still use traditional mechanical locks and tower bolts, home breaks are inevitable. Apprehending the culprit is sometimes impossible and important meetings are missed if no one's at home. To counter this, we developed our project by implementing a two-tier security system, which is server based, provides good enough accuracy and provide a lot of features for commercial use.. Artificial intelligence (AI) has gained a massive footprint in modern

society's day-to-day existence. Many don't realize it, but AI is now a primary driving force for many things we currently enjoy and do. It is part of nearly everything we do, from the moment your alarm, placed across the room on top of a dresser, woke you in the morning and you reached for your phone to turn it off to the end of the day when you used your car's GPS to find the least-congested route from your office to your home.

It's a sobering realization that AI's integration into our lives is just starting. It's becoming more prominent in another area of our home life: home security.

Many homeowners are now choosing AI-powered home security systems that take conventional electronics like e-locks and CCTV networks to the next level.

What Makes an AI Home Security System Appealing?

AI and home security are a match made in heaven. Security is paramount for every household, and AI enhances its functionalities to be more agile, flexible and effective. An AI home security system also offers a high degree of personalization. One of the best things about investing in an AI smart home security is that you can customize and pick options that best suit your lifestyle and needs. Of course, the "intelligence" of the technology is another significant benefit because it makes home security SOPs easier to implement, for example, locking your front doors when leaving the house. It's also more convenient to use, for example, activating a door's smart feature to open when you have both hands full carrying groceries, carrying your sleeping child, etc.

Considering the present and predicted capabilities of AI and home security technology, what can we expect from innovators and manufacturers of modern home security systems moving forward?

## 2. RESEARCH OBJECTIVES

Home protection and family safety are the primary purposes of a home security system. While this includes detecting burglary, a security system also detects a number of other threats, including smoke, fire, carbon monoxide poisoning, and water damage. Whether you self-monitor or pay for professional monitoring, you can know if there's danger in your home, wherever you are. A professionally monitored security system will call emergency services for you if a smoke or flood sensor is activated, whether you are home, away, or asleep. It's worth noting that you have to buy the security company's equipment in order to get professional monitoring of smoke and water sensors, which is not included in standard packages and comes at an additional cost.

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## THE PROS OF AI HOME SECURITY

When we discuss artificial intelligence in cyber security it is nothing new. In fact, two years ago, in forums people would discuss how artificial intelligence and machine learning in security areas would change the future as data is at the central part of cyber security trends. You can get CEH v12 training online in order to learn about various cyber security related topics and threat landscape.
In cyber security, artificial intelligence proves to be beneficial as it improves the way security experts analyze, study, and understand cybercrime. It improves the technologies that companies use to combat cybercriminals and helps organizations keep customer data safe. But, on the other hand, artificial intelligence can be a very exhaustive resource and may not be practically applicable in every application. Most importantly, it can also serve as a new weapon for cybercriminals who may use this technology to sharpen their techniques and improve their cyberattacks.

It is impossible for a normal human to identify and block all the threats faced by a company because of the fact that every year, hackers find out a different way to launch various types of attacks that have a distinct objective. For example, in earlier times log4j was not known though it was present from the beginning, finally, it was reintroduced in December 2021. The network can suffer massive damage with the introduction of these new types of unknown threats and they can have a deep impact on the organization if you fail to detect, identify, and prevent them.
Artificial intelligence (AI) has revolutionized various industries, and cybersecurity is no exception. AI security solutions have emerged as powerful tools for identifying and mitigating potential threats in today's digital landscape. By leveraging machine learning algorithms and deep learning techniques, AI can analyze vast amounts of data, detect malicious behaviors, and provide organizations with enhanced protection against cyberattacks. In this article, we will explore the concept of AI security, its common applications, the benefits it offers, and key considerations when evaluating AI cybersecurity vendors.
On a basic level, artificial intelligence (AI) security solutions are programmed to identify "safe" versus "malicious" behaviors by cross-comparing the behaviors of users across an environment to those in a similar environment. This process is often referred to as "unsupervised learning" where the system creates patterns without human supervision. For some AI platforms, like Vectra, "deep learning" is another key application for identifying malicious behaviors. Inspired by the biological structure and function of neurons in the brain, deep learning relies on large, interconnected networks of artificial neurons. These neurons are organized into layers, with individual neurons connected to one another by a set of weights that adapt in response to newly arriving inputs.

Sophisticated AI cybersecurity tools have the capability to compute and analyze large sets of data allowing them to develop activity patterns that indicate potential malicious behavior. In this sense, AI emulates the threat-detection aptitude of its human counterparts. In cybersecurity, AI can also be used for automation, triaging, aggregating alerts, sorting through alerts, automating responses, and more. AI is often used to augment the first level of analyst work.

The adoption of AI cybersecurity solutions offers several Objectives for organizations and their IT and security teams:

1. **Enhanced Data Processing**: AI's capabilities enable the processing of large volumes of data at high speed, providing organizations with comprehensive insights into potential threats.
2. **Augmentation for Resource-Constrained Teams**: AI fills the resource gap for smaller or less resourced cybersecurity teams by automating routine tasks and providing continuous protection.

**Consistent and Long-Term Protection**: AI systems provide consistent and continuous protection, reducing the risk of human error and offering long-term defense against evolving threats.

**Intelligent Surveillance**

Artificial intelligence (AI) has gained a massive footprint in modern society's day-to-day existence. Many don't realize it, but AI is now a primary driving force for many things we currently enjoy and do. It is part of nearly everything we do, from the moment your alarm, placed across the room on top of a dresser, woke you in the morning and you reached for your phone to turn it off to the end of the day when you used your car's GPS to find the least-congested route from your office to your home.

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The following are examples of how AI has improved surveillance for residential use:

- **Real-time Video Analysis**: AI technology can identify threatening vs. non-threatening subjects caught in the camera frames.
- **Remote Surveillance:** An AI home security camera is an upgraded version that empowers homeowners to keep an eye on their homes while at work, on vacation or anywhere outside their homes.

- **Intelligent Recognition:** AI has enabled surveillance cameras to distinguish between a squirrel darting across the yard and a human scaling a wall and walking across an enclosed area. Security cameras with this capability can trigger an alarm, alerting the occupants inside the house of a potential threat and notifying the house's owner of suspicious, real-time activity on the premises via text, messaging or email. Advanced security cameras can even send clips of the recording along with the notification.

**Greater Visibility**

An AI home security camera gives homeowners greater visibility throughout their properties. Multi-camera setups are the norm today, and most systems enable homeowners to toggle between outdoor and indoor views, as well as long shots and close-ups of each camera feed inside the house. This is again ideal for households with small children who sometimes slip away unnoticed and unsupervised.

Other AI-powered features that increase residential surveillance coverage include:

- **Real-time Video and Audio Transmission**: This feature is common in households with young children left home with their older siblings or nannies while the parents are at work. Parents can remotely view real-time and recorded footage of what's happening inside their house on their phones or computers.

- **Integrated Speaker and Microphone:** An added feature to real-time video and audio transmission, the built-in speakers and microphone in AI surveillance cameras allow homeowners to talk to people left at home as though they are making a phone call.

- **Motion Detection**: Modern cameras can pan to capture a wider angle or focus and zoom in on a specific point on command. This feature heightens remote surveillance, giving homeowners greater visibility and control over their home security system.

- **Drones**: Drone surveillance is helpful in vast estates and residential properties isolated in undeveloped areas. AI-powered drones provide much broader video coverage, can map the physical environment and identify anomalies homeowners need to look out for.

Predictive Analytics

One of the best features about AI is its ability to analyze patterns and predict future outcomes with a high degree of accuracy. This capability is usually associated with data analytics and forecasting for business, marketing or finance. Fortunately, home security innovators saw its potential and compatibility with surveillance and integrated AI predictive analytics into CCTV.

With this capability, an AI home security system can analyze camera images and footage. It can then identify potential threats and predict when and where a break-in will happen. Also, with rapid-fire alarm notifications, homeowners can immediately respond to real-time threats inside or outside their homes. Predictive analytics in home security empowers homeowners to be proactive about their safety and prevent potentially devastating incidents from happening.

Examples of features that benefit from AI's predictive analytics are:

- **Robotic Monitoring:** Private estates no doubt still see value in hiring security guards but can also take advantage of AI-powered robotic monitoring systems. People get tired and may overlook something when they're not 100% focused. Robotic monitoring can support or take over completely to give people time to rest and take a break. With all of the capabilities of AI, the security system can watch over the property and contact emergency services if it detects and predicts a potential threat.

- **Motion Detection With Sensors:** Surveillance cameras with built-in sensors capture the data AI analyzes to identify possible threats. AI also enhances the cameras' visual and motion trackers to identify non-threatening and non-intrusive subjects like a pet, an insect hovering near the camera or cars speeding on the street right before the house. Since it can distinguish between threatening and non-threatening situations, the security system is less likely to send false alerts to the authorities.

- **Behavior Tracking**: Advanced AI security systems track people's routines and automatically configure home security protocols as needed. For example, the system will recognize that the house stands empty during certain hours and days. It will heighten surveillance and access protocols and alert homeowners if it detects unusual activity inside or around the house.

**Voice and Facial Recognition**

With AI able to identify animals vs. humans, security tech innovators took this a step further to add facial recognition to home security. Sophisticated systems also include voice recognition, similar to how smart home technologies work.

AI smart home security with built-in voice and facial recognition enables homeowners to open or lock doors, turn on alarms, turn on or switch off lights and more by showing their face to a scanner or giving out a voice

command. These features are becoming increasingly popular, especially since they complement smart home systems.

**AI brings the following features to smart home security systems:**

- **Authorization Recognition**: The smart home devices and home security system will only grant access to homeowners registered in the system as "authorized." This prevents guests and outsiders from controlling the home's smart devices or manipulating security protocols without the homeowner's knowledge.

- **Intruder Alert**: AI facial recognition is also used to identify unauthorized people and alert homeowners when strangers roam inside their homes. This feature is helpful when people hold large parties at home and there are too many people to keep an eye on at once.

**Smart Locks**

AI-powered smart locks use facial and voice recognition to open doors, similar to how RFID keyless locks work. However, instead of needing a key card or traditional key, homeowners can simply walk up to the front door for a facial scan or to utter a voice command. The system recognizes authorized individuals versus strangers and restricts access to the latter.

- **Keyless Entry:** This is a convenient feature that ensures homeowners won't have to stress over finding their keys every morning or losing them in public.

- **Log**: Smart locks are cloud-based and store data virtually. Homeowners can review access logs and verify the time and date people accessed locked rooms in the house. While not a typical feature in regular homes, it is helpful in large estates where over 20 contractual household staff work in shifts.

Ultimately, AI enhances the earlier iterations of electronic home security systems, making them customizable, flexible and more proactive. Home security can
also stop threats and not just provide a passive defense. Thanks to AI, households have greater control over their security measures and always be on top of
things, whether they are in or out of the house.

Learn more about AI home security integrations, and discover how to incorporate this technology into your home security system. Get in touch with Aeon
Systems, and let's talk about the most effective ways to protect your family and your home.

## 3. PROPOSED SYSTEM (METHODOLOGY)

A security system is defined as to detect intrusion, unauthorized entry into a building or a protected area and deny such unauthorized access to protect personnel and property from damage or harm. Security systems are mainly used in residential, commercial, industrial, and military properties for protection against burglary (theft) or property damage, as well as personal protection against intruders. Car alarms likewise protect vehicles and their contents. Prisons also use security systems for control of inmates. Among home security in residential is most prominent. Now days, home security and surveillance system is an essential part of any modern automated home. The basic design of a security system begins with analyzing the needs of the inhabitants, surveying existing technology and hardware, reviewing system costs, considering monitoring choices and finally planning the installation. According to the European Institute for Crime Prevention and Control International statistics on crime and control 2011, to analyze the no. of burglaries in a year we experienced that Bangladesh got 2.2 points

and ranked 53rd position as well as 0.7 points and ranked 71st position for autotheft in the world. Now if we look the worlds one of rich country USA we see that they positioned 6th in autotheft and 9th in burglary [8]. Their surveying also shows that most of the burglary occurred in residential area, office as well as bank. Non-Automated security systems were found non-reliable. Doors were fitted with lock and key system which can be opened easily. Even the human presence of security guard may not be completely trustworthy. Every system from the past has been found to be very much vulnerable. Home is a place where security is must, to keep all the valuables and appliances safe. The owner should have the confidence to step out of the house with the feel that nothing can happen to the Home. This feel will only arise when the home is equipped with a reliable security system. For this reason, in this paper it has focused about the maintenance of home security.

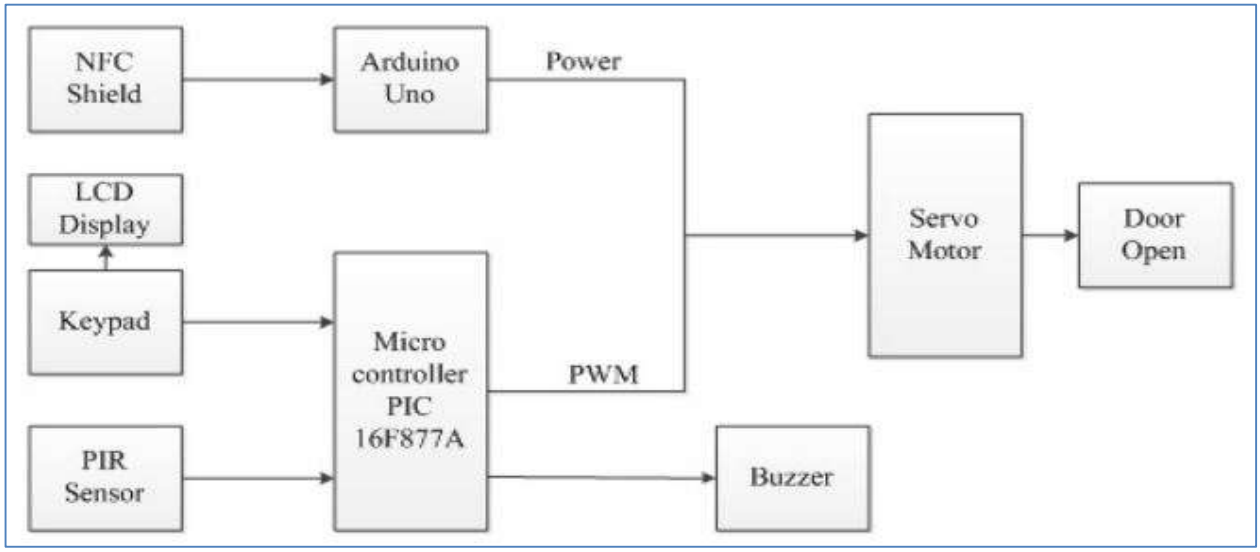



**FIG 01** BLOCK DIAGRAM OF OPERATIONAL METHOD

Above block diagram shown in figure 19 represents the working method of our project work. Here we have taken NFC (Near field Communication) tag card, password from keypad and infrared ray i.e motion by PIR sensor as input. The output of this project is LCD display, Buzzer alarm and servo motor. For hardware implementation we have used interfacing a PIC (Peripheral Interface Controller) microcontroller 16F877A 16_2 LCD display, a matrix (4_4) keypad, a 21 servo motor used for door locking and PIR sensor also incorporates a power supply unit. Arduino Uno provides power supply and microcontroller provide PWM signal to operate the servo motor. If keypad only pressed or wrong password provided servo only get PWM. So it will not operate to open the door owing to absence of required power. Besides, if only NFC tag card is provided in front of shield the servo only gets power but owing to PWM it will not operate. Here microcontroller also takes PIR sensor signal as input. When it gets this signal it send signal to Buzzer and sounds alarm.

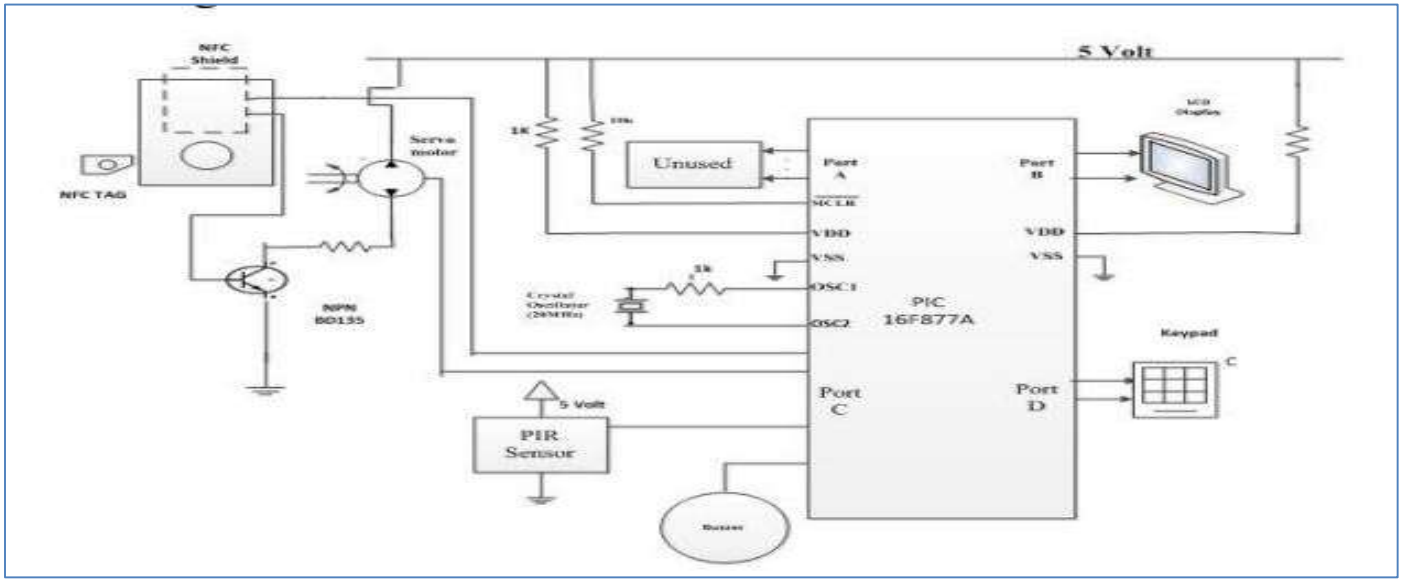
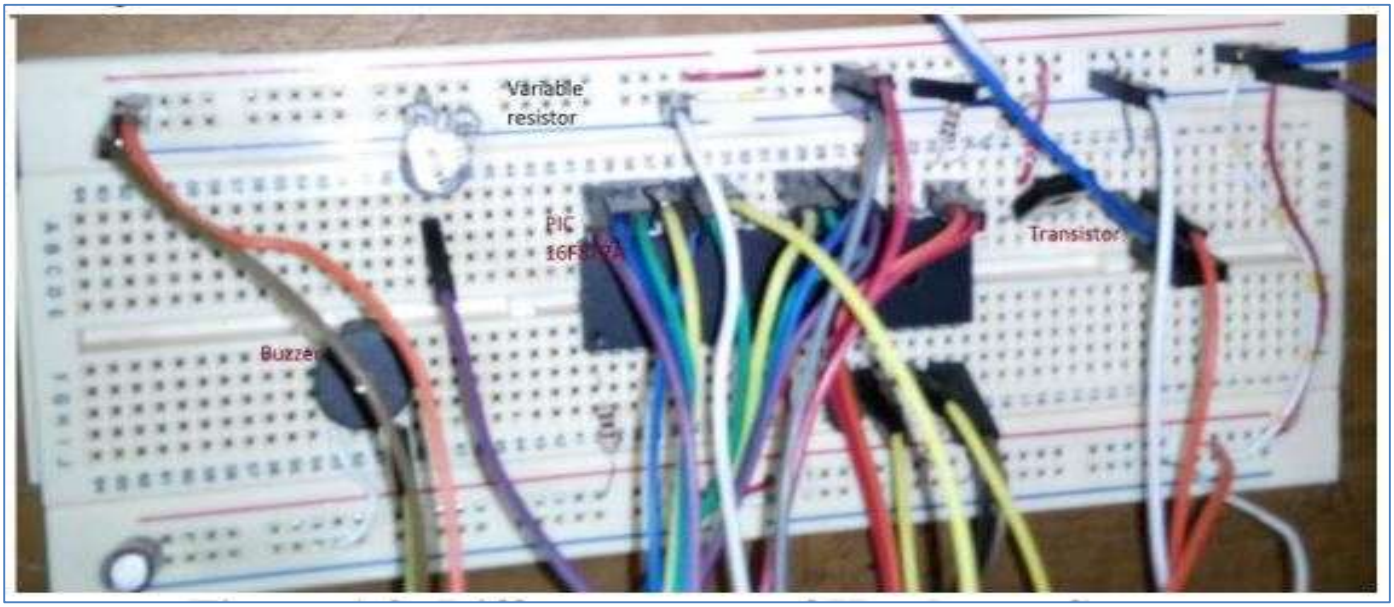



FIG 02 : CIRCUIT DIAGRAM OF REQUIRED PROJECT

The above figure 1.2 shows the complete circuit diagram of the project. Here microcontroller PIC 16F877A has four port. Port A Port B, Port C and Port D. Every port has eight pin such as A0- A7 similarly B0- B7. Here port A is remained unused. Port B is connected to 16 2 LCD display in where 8pin of port B is attached with LCDs 8 wire. Beside Port D is connected with 4$_4 keypad similarly here all pin is connected with keypad. Now remaining port C one of pin is connected with PIR sensor, other pin is connected with servo motor and another pin is connected with buzzer. Here 2pin for VDD and 2 pin for VSS. We have connected VDD with power supply 5 volt through 1k resistor and VSS with ground. There is also a pin MCLR for clearing any data saved in memory. It also connects with 5 volt power supply through 10 kilo ohm resistor. OSC1 and OSC 2 pin is used for supply clock for PIC operation. Here crystal oscillator is used to generate clock and capable of generating 20 MHz clock signal. When instructions are loaded into the microcontroller, microcontroller verifies the input from keypad with the stored password, to interface with peripheral devices and to change the current password. The EEPROM of PIC stores the passwords set by the user. when any password is inserted through the keypad, microcontroller decode the input, verify it with the stored password..If password matches which was set by authorized person, microcontroller sends signal to servo motor . On the other side when NFC tag card is placed near the shield, the coil inside the tag is energized, get power from shield and match. Then a signal comes from arduino uno to the base of NPN transistor. Transistor acts as a switch when it gets signal its base and turned on. Then it connects servo to power supply on the other side when the correct password is pressed then a signal goes to servo which in turn operates the shaft. and the lock is operated. Password changing option is another important part of the mentioned electronic lock system. It is restricted to unauthorized person because there is a fixed security code which is only known to the authority of the lock. LCD shows the output result, the password is being inserted whether correct or wrong. Keypad is used as input unit of the lock system.




**6.**

**FIG 03 :** Different parts of Hardware Setup.

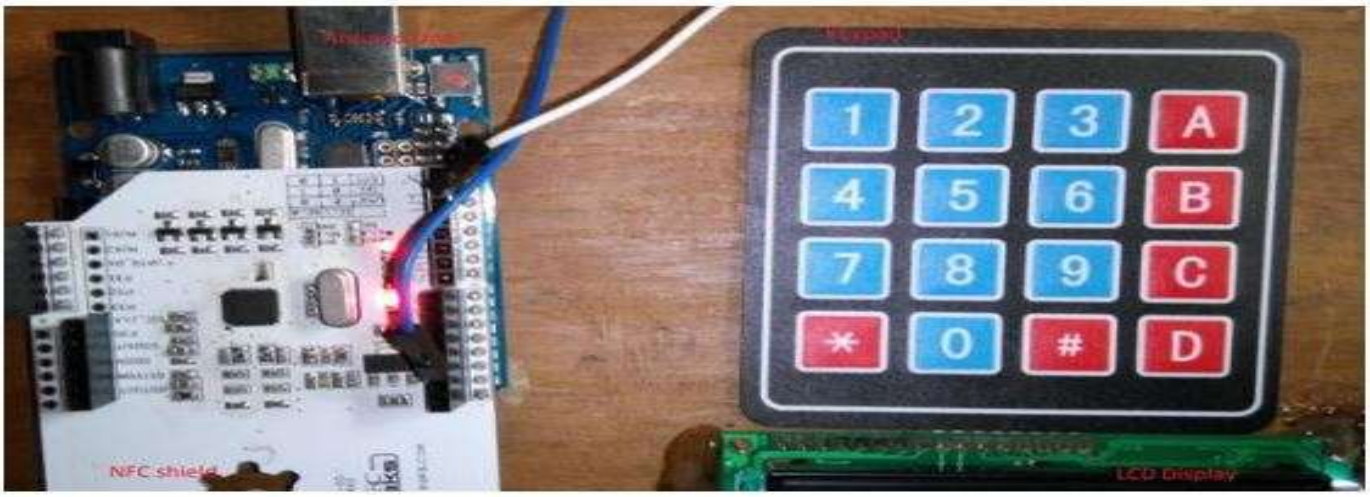



**FIG 04 :** Keypad, LCD Display and NFC shield

## SOFTWARE IMPLEMENTATION

Proteus is software for microprocessor simulation, schematic capture, and printed circuit board (PCB) design. Anyone cab build any project on computer screen using Proteus. It has been used 7.7SP2 software to simulate the project. For simulation the proteus window has opened. Then it has placed the all necessary component from library (E.g. PIC16F77A). The Port B is connected with LCD display 8 pin. Port D all pins are connected with Keypad. Here one pin of port C is connected with servo motor. Then we loaded the HEX file generated from microC Pro into microcontroller. After simulating the circuit it found no error. Then the correct password has pressed which represents the password is right beside servo operates.

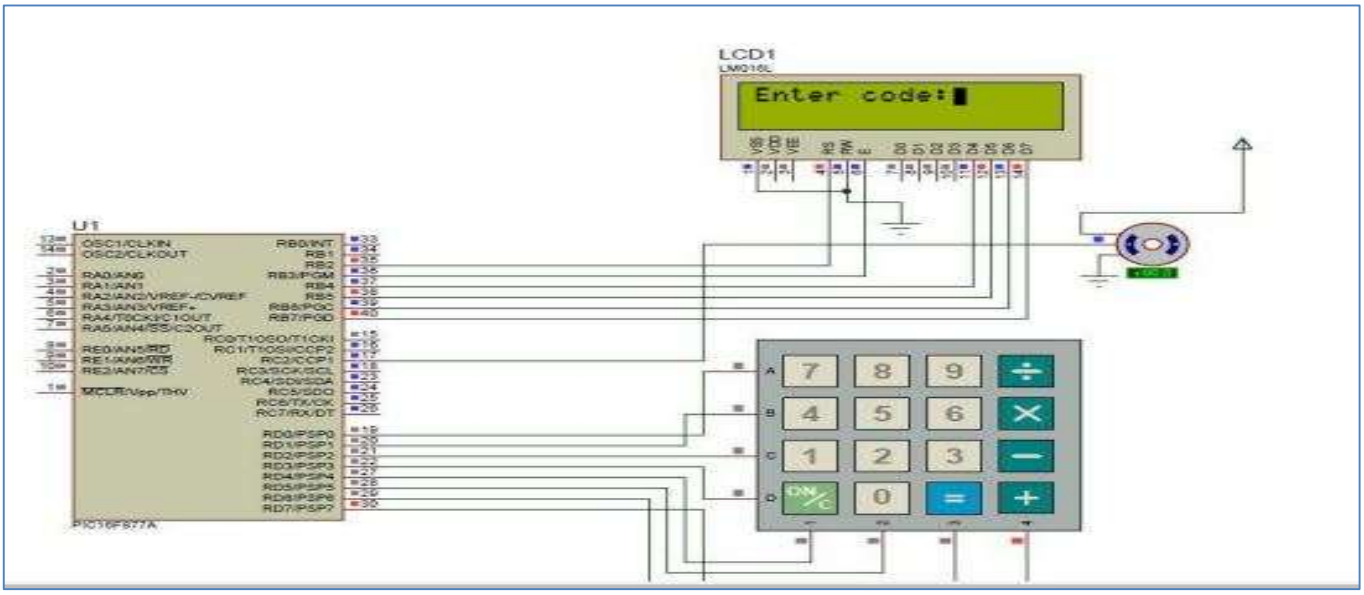



Figure 05: Circuit Diagram after Simulation.

## RESULT & DISCUSSION

When it shows NFC tag in front of NFC shield and presses password there is a text in a LCD display Enter Code is shown in figure 3.1 If correct password is pressed then it shows Correct Password and wrong password pressed it shows Wrong Password in display shown in figure 25 and 26 When password is correct servo motor gets power and open the door. After entrance, PIR sensor will not work [16]. When the person goes out of the door, he should provide NFC tag in the door and then press C for close in keypad. For password changing the person should press A in keypad. Then there is a text in a display Enter Old Code. After pressing old code, display shows it wants Enter New Code. Providing new code,
the password will be unchanged until user does not want to change password is shown in figure 27 and 28. Now if a person enters the room without providing NFC tag and password PIR sensor works and
sounds alarm.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In this methdology it has been seen the prototype model works without any basic error. So it can be implemented in practical field. Beside the cost of the project is not too much. Here it has provided utmost security so it is quite impossible to any burglar to enter the room without concern of owner. If available financial and technical support from the concerned Govt. section and organizations is found, then it will be possible to commercialize the proposed lock for the benefit of the people of our country. Some feature has been added to make the project more efficient. It could be implemented it by GSM based home security system. For this when a burglar enters the room without the concern of owner a sms will be sent to the user. Then he will take precautionary measure. It may be used another technique called biometrics which is more prominent and a recognized means of positive identification. Some new technologies such as fingerprint scanning, retinal scanning and iris scanning, and voiceprint identification also can be inserted. Moreover it could be useful for various sensors such as gas sensor, fire sensor for more improvement of the security of home.

## 4. CONCLUSION AND FUTURE WORK

Today, home security is fairly straightforward. If you live in a home that has an "alarm" you've got a bevy of motion sensors dotted around your house, a central keypad by your front door with a standard keypad to disarm it and a box on the front of your house that says "look at me, I'm protecting something valuable inside".

With the steady march of connected devices invading the home, and a number of companies looking to improve how we secure it, the future of home security is going to change drastically in the next couple of years, whether that is remotely controlling our lighting, seeing inside our house, or merely having sensors on our doors and windows detecting movement

The scope of the project was to implement principles of A.I. and IoT in the security sector. We were able to implement our face and voice recognition system efficiently and with low bill of materials. The code can be more refined, and more features can be added in order to make it into

a full-fledged product for commercial use. Instead of an ESP8266 SoC, a Bluetooth enabled ESP32 can be used in order to add Bluetooth support so that the admin can still enter the house even when there is a power outage. Home security system is a solution to problems like theft, instruction, fire, energy conservation etc. The Raspberry Pi is a great platform for building highly capable, embedded systems. This makes it possible for users to rest assured that their belongings are secure. Now a day's people are not aware about the importance of energy conservation. So in our project we are implementing a system for energy conservation by the use of PIR sensor. So this will save the electricity. The end product will have a simplistic design making it easy for users to interact with. The project is aimed at developing the security of Home against Intruders, and THEFT.

In this system we found some mechanism, techniques, methods like face recognition, voice recognition, door lock, spectrum methods etc.

## 5. ACKNOWLEDGMENT

The IoT, (IInternet Of Things) with its Inter-connectivity capability, has many advantages to technology as a whole but also security. In the near future, your home security system could have either locally or in the cloud a database with friends, family or potential offenders and persona non grata, and by using facial recognition technologies, can, depending on the gravity of the situation, either silently notify you in a low priority breach, alert you in a medium security breach, or go full metal jacket alerting everyone from you to police and security companies with who you have contracts.

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"Nothing concerns us more than the fear of someone breaking into our own home, yet very few homeowners heed the warnings until it's too late," explains Kris Hogg, chairman of CEDIA, the Custom Electronic Design and Installation Association. "A lot of the time monitored alarm systems can be integrated with the very latest hi-tech lighting and automation facilities in order to provide even greater levels of security."

Those systems include integrating the alarm system with an intelligent lighting system, such as the Lutron Homeworks system, so all the lights in your property will automatically switch on or flash incessantly when an intruder is detected, or setting your lights to randomly come on and off while you are on holiday to fool would-be burglars.

## 6. REFERENCES

[01]Emanuela Ferraro, Jennifer E. Liu, Pooja Advani, Joerg Herrmann, Anna Yang, Anita Fung, Bann-Mo Day,Et. And Al.[2021] 'Noninferiority of Artificial IntelligenceAssisted Analysis of Ki-67 and Estrogen/Progesterone Receptor in Breast Cancer Routine Diagnostics', Mod Pathol 36 (2023) 100033

[02]Niklas Abele Et. And Al. [2023] 'The role of artificial intelligence-driven soft sensors in advanced sustainable process industries: A critical review', Engineering Applications of Artificial Intelligence 121 (2023) 105988

[03]Northwest Composites Centre and Aerospace Research Institute Et. And Al.[2023] 'Artificial intelligence as a boundary-crossing object for employee engagement and performance', Journal of Retailing and Consumer Services 73 (2023) 103376

[04]Catherine Prentice Et. And Al.[2023] 'intelligence-based image and speech recognition technologies', Presentation Number: 1308-097

[05]Hu Fan Et. And Al.[2023] 'Research on innovation and application of 5G using artificial intelligence-based image and speech recognition technologies', Journal of King Saud University – Science 35 (2023) 102626

[06]Abdullahi B. Saka Et. And Al.[2023] ' Conversational artificial intelligence in the AEC industry: A review of present status, challenges and opportunities', Advanced Engineering Informatics 55 (2023) 101869

[07]Ramanpreet Kaur Et. And Al.[2023] 'Artificial intelligence for cybersecurity: Literature review and future research directions', Information Fusion 97 (2023) 101804

[08]Onur Karaman Et.and Al.[2022] 'Development of smart camera systems based on artificial intelligence network for social distance detection to fight against COVID-19', Applied Soft Computing 110 (2021) 107610

[09]Benjamin Purgason Et. And Al.[2021] 'Security Through Behavioral Biometrics and Artificial Intelligence', Procedia Computer Science 12 ( 2012 ) 398 – 403

[10]Vania Baldi Et. And Al.[2021] 'Challenges to incorporate accountability into artificial intelligence ', Procedia Computer Science 204 (2022) 519–523

[10] Hyeon Jo Et. And Al.[2020] ' Impact of Information Security on Continuance Intention of Artificial Intelligence Assistant ', Procedia Computer Science 204 (2022) 768–774

[11]Union - oppo Et. And Al.[2023] ' The use of artificial intelligence in migration-related procedures in of artificial intelligence in migration-related ', Procedia Computer Science 207 (2022) 3639–3645

[12]Stefan-Octavian Bezrucav Et. And Al.[2022] 'Mobile Manipulators: A Case Study on a Fully Autonomous Manufacturing Application, *Stefan-Octavian Bezrucav et al. / Procedia Computer Science 217 (2023) 306–315*',

[13]Marie Francisco [2023] 'Artificial intelligence for environmental security: national, international, human and ecological perspectives', 1877-3435/© 2023 The Author(s). Published by Elsevier B.V.

[14]Eve Bohnett Et. And Al.[2022] ' Human expertise combined with artificial intelligence improves performance of snow leopard camera trap studies', Global Ecology and Conservation 41 (2023) e02350

[15] Dimitrios Tsiktsiris Et. And Al.[2022] 'Novel Image and Audio-based Artificial Intelligence Service for Security Applications in Autonomous Vehicles ', Transportation Research Procedia 62 (2022) 294–301

[16]Mohammad Reza Maghami Et.and Al.[2023] 'Challenges associated with Hybrid Energy Systems: An artificial intelligence solution', Energy Reports 9 (2023) 924–940

[16]Sarah Lennard Et. And Al.[2023] 'Improving nocturnal event monitoring in people with intellectual disability in community using an artificial intelligence camera', Epilepsy & Behavior Reports 22 (2023) 100603

[17]R.P. dos Santos Et. And Al.[2022] 'Automated healthcare-associated infection surveillance using an artificial intelligence algorithm', Infection Prevention in Practice 3 (2021) 100167

[18]Omid Memarian Sorkhabi Et. And Al.[2021] ' Monitoring of dam reservoir storage with multiple satellite sensors and artificial intelligence', Results in Engineering 16 (2022) 100542

[19]Albert De Vries Et. And Al.[2023] 'Invited Review: Examples and opportunities for artificial intelligence (AI) in dairy farms*', Applied Animal Science 39:14–22

[20]Innocent Kutyauripo Et.and Al.[2023] ' Artificial intelligence applications in the agrifood sectors', Journal of Agriculture and Food Research 11 (2023) 100502

[21]Abdulaziz Al-Besher, Kailash Kumar[2022] ' Use of artificial intelligence to enhance e-government services', Measurement: Sensors 24 (2022) 100484

[22]Suhaili Othman Et. And Al.[2023] 'Artificial intelligence-based techniques for adulteration and defect detections in food and agricultural industry: A review', Journal of Agriculture and Food Research 12 (2023) 100590

[23]Arvidsson I. , Simoulis A. ,Svanemur E.Et. and Al.[2021] 'Validation of an artificial intelligence-based algorithm on prostate biopsies from patients on active surveillance', European Urology Open Science 2022;44(Suppl 2):S206

[24]Enrico Coiera Et. And Al.[2022] 'Evidence synthesis, digital scribes,and translational challenges for artificial intelligence in healthcare', Medicine 3, 100860, December 20, 2022

[25]Ayoub Oufadel Et. And Al.[2021] ' In-situ heat losses measurements of parabolic trough receiver tubes based on infrared camera and artificial intelligence', Environmental Challenges 10 (2023) 100679

[26]Kristin A. Bartlett Et. And Al.[2023] ' Characterizing sensor accuracy requirements in an artificial intelligence-enabled medical device', IPEM-Translation 1 (2022) 100004