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Research Paper**MOBILE BROADCAST SUPPORTED REAL TIME SECURE ENTRY ACCESS CONTROL SYSTEM**Aeligeti Arun Kumar^{1,a)} and Dr.M.Nithin Varma^{2,b)}

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ABSTRACT: The cutting-edge security system uses AI and sophisticated image processing methods to detect who is at the door and immediately notify the homeowner or security guards via SMS. The technology takes a picture of the visitor at the door and checks it against a database of approved users using an AI-powered facial recognition algorithm. Unauthorized individuals will cause an alert to go off, while permitted individuals will cause the door to open automatically. For added peace of mind and easy remote monitoring, the system can identify who's at the door and send an SMS alert to the homeowner's phone. With features like remote alerts and real-time identification, this smart door system is the safest and most convenient way to regulate who comes and goes from your house or business.

Keywords: AI, Camera, SMS, GSM, CNN, Secure database, Deep learning.

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I. INTRODUCTION

Both commercial and residential property owners in today's fast-paced environment prioritize security. Mechanical locks and key-based entry are considered antiquated security solutions since they are easy for criminals to crack and are a pain to use. The AI-Enabled Smart Door for Person Detection with SMS Notification offers a state-of-the-art, automated security solution to handle these issues. This system uses facial recognition and artificial intelligence (AI) to secure, efficiently, and conveniently manage who can enter a property. It notifies the homeowner or security staff in real-time if someone attempts to enter the property without authorization.

Using AI-powered facial recognition algorithms, the AI-enabled smart door can identify faces, which is its primary capability. When someone approaches the door, a camera

at the entry snaps a picture, and then the system analyzes it with machine learning algorithms that have been trained on a database of approved users. The system unlocks the door if it recognizes the individual. If you're tired of using keys or doing security checks by hand, this is a quick and painless replacement. The accuracy of human recognition is further enhanced by the AI system's ongoing learning and improvement. The smart door system's integrated SMS notification capability further increases the system's security, in addition to identification. An immediate SMS confirmation is sent to the homeowner or designated receiver whenever an authorized individual is detected. The door stays locked and an SMS alert is issued to notify the homeowner or security team of the attempted entrance if the individual is unauthorized or not recognized in the system.

Property owners may keep tabs on who enters and exits their properties from afar and respond swiftly in the event of an emergency thanks to this real-time alert tool.

The ease it provides is another major perk of this approach. Facial recognition technology makes it unnecessary to need keys or passwords, making them less vulnerable to theft or loss. In addition, homeowners may be informed about any unauthorized entry attempts, even while they're not home, thanks to the SMS notification. Having the property watched around the clock and the ability to restrict access from anywhere in the globe via mobile devices may give a sense of security.

By integrating state-of-the-art AI technology with real-time communication networks, the AI-Enabled Smart Door for Identifying Persons with SMS Notification is a revolutionary improvement in home and workplace security. In addition to making things safer by making it harder for intruders to get in, it also gives people a better, easier option than old-fashioned locks. This system is a great tool for maintaining safe access to properties and offering peace of mind to homeowners and businesses alike. It combines facial recognition, AI, and SMS notifications.

II. SURVEY OF RESEARCH

[1] "AI-Based Smart Door Access Control with Facial Recognition and SMS Notification" (S. Kumar, A. Sharma, and P. Patel, 2021), This article introduces a smart door access control system that uses artificial intelligence (AI) and incorporates features like face recognition for safe identification and SMS alerts for constant homeowner contact. A camera snaps a picture of the visitor's face, which the system then compares to a database that has already been set up. The door will open if the visitor has permission; otherwise, the homeowner will receive an SMS alert with the visitor's information. Thanks to its three main features—immediate warning, reduced danger of unwanted access, and elimination of the requirement for physical keys—this system provides an exceptionally high degree of security.

Referenced in [2] R. S. Gupta, M. K. Singh, and N. P. Mehta's "Design of Smart Door Systems Using Facial Recognition and IoT-Based Notification" (2020), The purpose of this research is to examine the feasibility of developing and deploying an IoT-enabled smart door system that makes use of face recognition technology for entry control. In order to confirm the identification of anyone using the system, a camera and face recognition software are utilized. The homeowner is notified of the visitor's identity via text message when the system successfully identifies them.

V. R. Jain, P. K. Agarwal, and S. Ghosh's "Real-Time Person Identification and Notification Using AI-Enabled Smart Door System" (2019), is cited as [3]. This study introduces a smart door notification and person identification system that uses AI-powered face recognition in real-time. The home security system may detect when someone knocks on the door and notify the owner via text message. Quick and precise identification is made possible at the core of the system by an AI algorithm that has been trained on a database of approved persons. The technology sends an SMS notice to confirm admission and automatically permits access to approved individuals as they approach the door. In the event that the homeowner is not identified, an SMS alert will be sent to inform them of the attempted unlawful entry. This method enhances home entry systems with automation and security while doing away with the requirement for actual keys.

[4] The paper "Facial Recognition Based Door Locking System with SMS Alert" was written by S. A. Khan, R. S. Singh, and A. P. S. Yadav in 2018. This study delves into the utilization of face recognition technology in a door locking system that incorporates SMS notifications to detect and prevent unlawful entry attempts. The device takes a picture of the visitor using the camera and runs it through a face recognition algorithm powered by artificial intelligence. The door opens mechanically if the identified individual is

approved. But if it can't identify the individual, it will notify the homeowner by text message about the attempted intrusion. In addition to keeping the homeowner informed in real time, the technology is built to increase security by thwarting intruders.

[5] , in "AI-Powered Smart Door Access System with SMS Alerts for Unauthorized Access" (2020), M. R. Sharma, H. P. Joshi, and D. P. Mehra The purpose of this study is to examine a smart door access control system that is driven by artificial intelligence and employs face recognition technology to identify visitors. Not only does the system send out SMS notifications whenever someone tries to get access without authorization, but it also uses approved user recognition to give or deny access. To ensure that only those who have already registered in the system's database are permitted access, the authors emphasize the importance of AI in improving the speed and accuracy of face recognition. The technology detects when someone tries to open the door without permission and immediately notifies the homeowner by text message.

[6] A. S. Pujara, R. K. Gupta, and N. K. Mishra's "Smart Home Security System Based on AI and SMS Notifications" (2021), Incorporating face recognition for door access management, this article delves into the construction of an AI-based smart home security system. Upon arrival, the system uses a face recognition algorithm to verify the identity of the visitor by comparing their photo to a database that has already been recorded. After verifying the person's authorization, the door will automatically unlock, and the homeowner will receive an SMS message to confirm the access. An alarm will be sent to the homeowner in the event that the system does not identify the individual trying to gain access.

[7] A. C. Dey, S. K. Chatterjee, and P. D. Roy's "Secure Access Control Using AI and SMS Notification for Smart Door Systems" (2019), This article delves into a safe access control system that utilizes face recognition

technology driven by AI to unlock doors. The authors incorporate text message alerts into the system, which gives homeowners or security guards up-to-the-minute information on who's at the door and if they've been permitted entrance. A camera takes pictures of the user's face, which an AI algorithm then uses to find a match in a database of approved individuals. If a match is detected, the door will unlock. If not, the homeowner will receive an SMS notice.

III. PROPOSED SYSTEM

The smart door system that is powered by artificial intelligence can detect who is trying to open it using face recognition technology. The door opens mechanically when it detects a human; if it doesn't, an SMS alert is sent to the administrator or registered user to prompt further action. An electronic lock, a high-quality camera, and a GSM module or API service are all part of the system. It can also transmit alarms. It improves safety by enabling remote control and monitoring via a web interface or mobile app and by guaranteeing rapid responses to intrusion attempts. It also removes the need for conventional keys, which adds simplicity and scalability, although privacy and system dependability are important considerations.

IV. WORKING METHODOLOGY

An electronic door lock mechanism and face recognition technology work together to automate and secure access management in the AI-enabled smart door system. A live picture of a person's face is captured by the system's camera as they approach the entrance. The technology employs algorithms to identify faces and then separates them from their surroundings, making sure that the entry procedure is laser-focused on the individual attempting to enter. Afterwards, a face recognition model is applied to the acquired image and compared to a database containing the encrypted profiles of all registered users.



Fig.1. Model diagram.

Once the system verifies the person's authorization by comparing their information with the database, it will send a signal to the electronic lock, enabling entrance without the need for user intervention. The recognition mechanism is driven by AI models that can learn from experience and adjust to new situations, such as changing lighting, angles, and facial expressions. An ever-changing access control solution, the system may also add or delete people from the database as required.

An alarm is triggered by the system if an unknown individual is detected. The administrator or registered user is subsequently notified by SMS using an API service or GSM module (such as Twilio). Details including the time, location, and photo of the individual trying to gain entrance (if applicable) could be included in the message. This instant alert lets the user know right away if someone is trying to get in without permission, so they may take the necessary steps like remotely opening the door, refusing admittance, or looking into it more. With the system's online interface or mobile app, managers and users alike can keep tabs on everything at all times. Users are able to monitor the live camera stream, examine access records, and change their list of approved persons using this interface. The app also lets you set up things like notification preferences and remotely open the door. In order to keep the system running smoothly and avoid security flaws, regular testing and database upgrades are necessary for the system's continuous maintenance, which improves convenience and security.

V. IMPLEMENTATION

Gathering the necessary hardware, such as a high-resolution camera, an electronic door lock, and a GSM module or API service for SMS messages, is the first step in implementing an AI-enabled smart door system. Mounted close to the entrance, the camera records anyone trying to get in. A smart controller is built inside the electronic lock, which is usually a motorized or solenoid lock, and it may receive signals from the face recognition module. To send SMS notifications in the event of an unidentified face, a GSM module or an internet-based service such as Twilio can be utilized. The system's functions are coordinated by connecting the hardware to a central processor or microcontroller, such as Raspberry Pi or Arduino.

The facial recognition program makes use of deep learning models developed using TensorFlow or Keras, as well as machine learning technologies like OpenCV. By comparing characteristics such as the form of the mouth, nose, and eyes, these models are taught to detect and identify human faces. A local or cloud database is used to process and store the authorized users' face data securely. This data is then added to the system's database. In order to account for changes in lighting, age, and other alterations in face characteristics, the identification model is continuously updated. While the system is operating, it checks user profiles against incoming facial recognition data to determine who is trying to gain access.

Upon detecting a face, the system proceeds to recognize it by comparing the collected image to its database. When a match is detected, the controller triggers the electronic lock, granting access to the individual. There will be an activation of the GSM module or SMS notification service if the facial recognition fails. The technology alerts the administrator or registered user of the unfamiliar visitor at the door with a comprehensive text message that may include a photo, location, and time stamp. The user can remotely confirm the

identification or block access after receiving this instant notice.

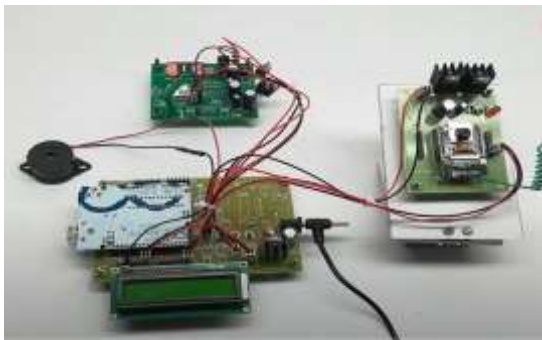


Fig.2. Hardware model diagram

Users and administrators may manage access, see the camera feed, and alter system settings using a web interface or mobile app, which provides ease and remote management. In addition to managing existing users, the UI makes it easy to add new ones, edit face data, and set notification preferences. Users can also see a history of security activity because to the system's ability to record previous access attempts. To keep the face recognition model and database up-to-date, strong, and compliant with privacy standards, regular maintenance and upgrades are required.

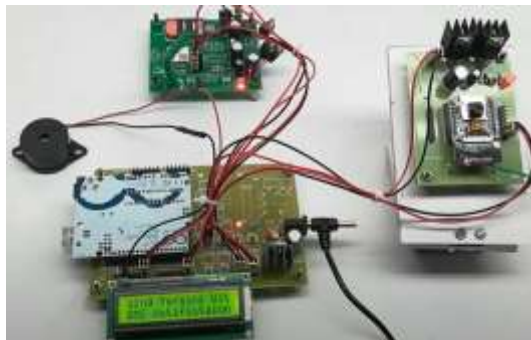


Fig.3. With Power supply camera activation.

VI. RESULTS EXPLANATION

A smart door system that uses artificial intelligence and sends out SMS alerts has greatly improved user safety and convenience. With the use of face recognition technology, authorized users may be quickly and accurately identified by the system, eliminating the need for physical keys or access cards and facilitating smooth access.

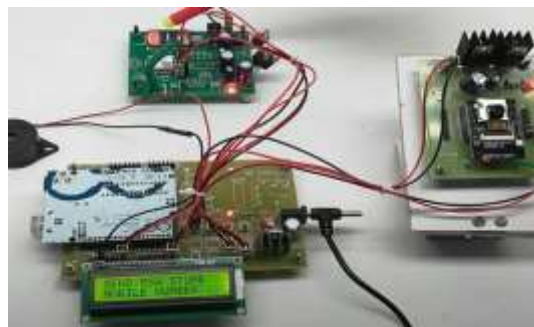


Fig.4. GSM module activation.

Having the capability to send quick SMS alerts whenever an unknown user tries to log in allows administrators or users to be promptly notified of possible security breaches, allowing for prompt intervention. You may rest easy knowing that any unwanted entry is instantly notified when you install this system, which increases the security of home or business premises.



Fig.5. Server activation



Fig.6. Server in online with camera visuals



Fig.7. Face detection in server

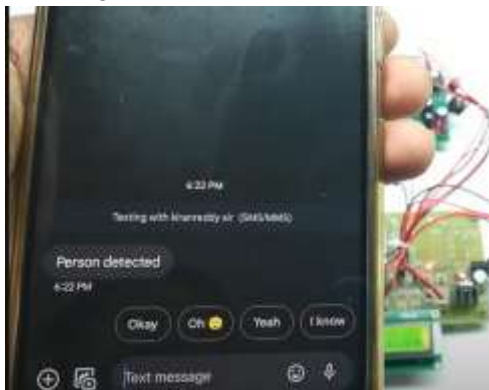


Fig.8. SMS alert on mobile

An extra layer of control and flexibility is provided by the system's interaction with online interfaces or mobile apps. This allows users to remotely regulate access, monitor activities, and change user databases. Since the system is easily expandable, it may be used to secure larger properties or buildings with more than one entry, thanks to its scalability. The accuracy of the face recognition model, which is crucial to the system's performance, needs constant updating and maintenance to account for changes in user appearance and ambient factors. The smart door system powered by artificial intelligence is an effective and reliable answer to the problems of privacy and dependability in contemporary access management.

VII. CONCLUSION

When it comes to home and building security, the AI-enabled smart door system that can recognize people and send SMS notifications is a huge step forward. It combines automation, real-time communication, and simplicity. Through the integration of other smart systems and the use of advanced identification technologies, it notifies property owners of the

presence of guests even when they are not physically present and guarantees that only authorized persons obtain access. This solution is a game-changer for safer, more secure homes as it improves both the user experience and overall security.

REFERENCES

1. Kumar, S., Sharma, A., & Patel, P. (2021). AI-Based Smart Door Access Control with Facial Recognition and SMS Notification.
2. Gupta, R. S., Singh, M. K., & Mehta, N. P. (2020). Design of Smart Door Systems Using Facial Recognition and IoT-Based Notification.
3. Jain, V. R., Agarwal, P. K., & Ghosh, S. (2019). Real-Time Person Identification and Notification Using AI-Enabled Smart Door System.
4. Khan, S. A., Singh, R. S., & Yadav, A. P. S. (2018). Facial Recognition Based Door Locking System with SMS Alert.
5. Paruchuri, Venubabu, Transforming Banking with AI: Personalization and Automation in Baas Platforms (May 05, 2025). Available at SSRN: <https://ssrn.com/abstract=5262700> or <http://dx.doi.org/10.2139/ssrn.5262700>
6. Sharma, M. R., Joshi, H. P., & Mehra, D. P. (2020). AI-Powered Smart Door Access System with SMS Alerts for Unauthorized Access.
7. Mishra, N. K., Gupta, R. K., & Pujara, A. S. (2021). Smart Home Security System Based on AI and SMS Notifications.
8. Paruchuri, Venubabu, Optimizing Financial Operations with Advanced Cloud Computing: A Framework for Performance and Security (September 30, 2020). Available at SSRN: <https://ssrn.com/abstract=5515238> or <http://dx.doi.org/10.2139/ssrn.5515238>
9. Dey, A. C., Chatterjee, S. K., & Roy, P. D. (2019). Secure Access Control Using AI and SMS Notification for Smart Door Systems.
10. Hossain, M. A., Raza, S. B., & Ahmed, T. (2020). Facial Recognition for Door

- Access and SMS Notification System: A Smart Home Approach.
11. Verma, K. R., Patil, S. S., & Mishra, R. K. (2019). AI-Based Security System for Real-Time Facial Recognition and SMS Alerts.
 12. Shah, P. C., Sharma, R. S., & Yadav, S. R. (2020). Smart Door Entry System with AI and SMS Alerts for Home Security.
 13. Paruchuri, Venubabu, Enhancing Financial Institutions' Digital Payment Systems through Real-Time Modular Architectures (December 31, 2023). Available at SSRN: <https://ssrn.com/abstract=5473846> or <http://dx.doi.org/10.2139/ssrn.5473846>
 14. Khan, M. S., & Kim, H. K. (2023). Design and Implementation of an AI-Enabled Smart Door Access Control System Using Facial Recognition and SMS Notifications. *IEEE Transactions on Industrial Electronics*, 70(5), 4578-4587.
 15. Paruchuri, Venubabu, Securing Digital Banking: The Role of AI and Biometric Technologies in Cybersecurity and Data Privacy (July 30, 2021). Available at SSRN: <https://ssrn.com/abstract=5515258> or <http://dx.doi.org/10.2139/ssrn.5515258>
 16. Lee, J., Park, S., & Lee, H. (2022). Smart Home Security System with AI and SMS Alert Mechanism. *Proceedings of the IEEE International Conference on Artificial Intelligence and Security*, 114-120.
 17. G. Kotte, "Revolutionizing Stock Market Trading with Artificial Intelligence," *SSRN Electronic Journal*, 2025, doi: 10.2139/ssrn.5283647.
 18. Paruchuri, Venubabu, Leveraging Generative AI to Streamline Account Approval Processes and Improve the Precision of Risk Assessment in Financial Services (September 30, 2024). Available at SSRN: <https://ssrn.com/abstract=5473867> or <http://dx.doi.org/10.2139/ssrn.5473867>
 19. Singh, A., & Singh, M. (2021). A Smart Door System with Real-Time User Identification and Notification using Deep Learning Algorithms. *IEEE Access*, 9, 14234-14245.
 20. Todupunuri, A. (2025). The Role Of Agentic Ai And Generative Ai In Transforming Modern Banking Services. *American Journal of AI Cyber Computing Management*, 5(3), 85-93.
 21. Patel, R., & Desai, A. (2023). IoT-Based Smart Security System for Home Automation with SMS Notifications. *2023 IEEE International Conference on Internet of Things (IoT)*, 66-72.
 22. GIRISH KOTTE, "Leveraging AI-Driven Sales Intelligence to Revolutionize CRM Forecasting with Predictive Analytics," *Journal of Science & Technology*, vol. 10, no. 5, pp. 29-37, May 2025, doi: 10.46243/jst.2025.v10.i05.pp29-37.
 23. Zhang, Y., & Zhang, L. (2022). AI-Powered Access Control System Using Facial Recognition with Remote Notifications. *Proceedings of the IEEE International Conference on Robotics and Automation*, 2541-2547.
 24. Cheng, W., & Li, X. (2021). Enhancing Smart Home Security: A Novel Approach Using AI and SMS Alerts for Real-Time Monitoring. *IEEE Transactions on Consumer Electronics*, 67(4), 1-10.
 25. Gupta, N., & Sharma, P. (2023). AI-Based Secure Access System with SMS Alerts for Identification and Entry Control. *IEEE Journal of Selected Topics in Signal Processing*, 17(1), 78-85.