



3rd IEEE International Conference on Computer Vision and Machine Intelligence (IEEE CVMI)

19-20 October 2024 • IIT Allahabad, Prayagraj, INDIA

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CVMI Best Paper Award (Computer Vision): Prayas Sanyal (Heritage Institute of Technology, Kolkata) (Paper ID: 467)

CVMI Best Paper Award (Machine Intelligence): Chinju John (IIT Kottayam) (Paper ID: 445)

IAPR Best PhD Thesis Award: Dr. Subodh Raj M. S. (National Institute of Technology Calicut)

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About IEEE CVMI 2024

The present world is witnessing rapid advancements in the field of Information Technology, specifically, in the areas of Computer Vision and Machine Intelligence, cherished by the society and industry. The amount of Research and Development activities across the globe has been drastically scaled up from the past one decade in these research areas. Hence, a new state-of-the-art Computer Vision and Machine Intelligence (CVMI) Conference avenue was conceived by Computer Vision and Biometrics Lab (CVBL), Department of Information Technology, Indian Institute of Technology Allahabad, India for the researchers to disseminate their research outcomes in 2022. 2nd CVMI 2023 was conducted by ABV-IITM Gwalior. The 3rd version of CVMI is being organized during October 19-20, 2024 at IIT Allahabad, Prayagraj, India. The world-wide leading research labs, including the Applied AI Research Lab, University of South Dakota, USA, Computer Vision Laboratory, Faculty of Computer and Information Science, University of Ljubljana, Slovenia, Sorbonne Center for Artificial Intelligence, Abu Dhabi, UAE, and Multimedia and Computer Vision Laboratory, Department of Computer Science and Information Systems, Birla Institute of Technology and Science, Hyderabad, India.

Secured Home Automation with Voice Recognition Using ML and IoT Devices

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Sovan Bhattacharya ; Anisha Singha ; Tanmoy Sural ; Rishi Raj Pandey ; Rohit Paul ; Shubhranshu Gorai **All Authors**

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In home, We utilize Gaussian Mixture Model to train voice recognition, and subsequently implement it in Internet of Things devices. We utilize these machine learning frameworks to enhance the precision, adaptability, and robustness of the system in order to mitigate security breaches. Hence, the main objective of the study is to develop a secure authentication system that is on one hand is more precise and on its other is user-friendly, with speech recognition playing a significant role to develop a next level home automation technologies.

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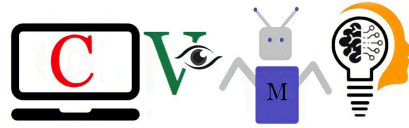
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I. Introduction

In computer science, the burgeoning field of smart house technology—also referred to as smart home automation—has seen significant expansion and change in recent years. High-end technology used in smart home automation can automatically start fans and lights in the house among other things. It not only offers convenience and security but also enhances the overall user experience. The goal of this project is to use machine learning to

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Secured Home Automation with Voice Recognition Using ML and IoT Devices

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Abstract—In home, We utilize Gaussian Mixture Model to train voice recognition, and subsequently implement it in Internet of Things devices. We utilize these machine learning frameworks to enhance the precision, adaptability, and robustness of the system in order to mitigate security breaches. Hence, the main objective of the study is to develop a secure authentication system that is on one hand is more precise and on its other is user-friendly, with speech recognition playing a significant role to develop a next level home automation technologies.

Index Terms—Deep Learning, Voice Detection, IoT, Automation, Artificial Intelligence

I. INTRODUCTION

In computer science, the burgeoning field of smart house technology—also referred to as smart home automation—has seen significant expansion and change in recent years. High-end technology used in smart home automation allows it to automatically start fans and lights in the house among other things. It not only offers convenience and security but also productivity to homeowners. The goal of this project is to use machine learning to integrate with voice recognition from speakers into the home automation system.

Advanced speech and speaker recognition algorithms allow us to create a device that gives users a comfortable and safe way to communicate with their smart home automation system. The primary goal of this research is a speaker voice recognition. It is the project's most crucial component. We were able to record people's voices using microphones. After that, a machine learning technique was used to train the vocal

signals, and they were checked to see if the results were same or not. We had tested the home automation after identification using Internet of Things devices like the Raspberry Pi 4.

The theoretical underpinnings of voice recognition, IoT, and machine learning technologies will be covered in more detail in the later following parts of this article. We will also look at the state of secured home automation systems today, emphasizing important approaches, difficulties, and new developments. We also seek to clarify the potential of machine learning (ML)-driven voice recognition in bolstering the security of Internet of Things (IoT)-based home automation systems through empirical research and theoretical investigation.

Secured home automation is a revolutionary approach towards protecting and interacting with our little homes. Through the utilization of machine learning, speech recognition technology, and Internet of Things devices, homeowners may reap the benefits of a networked home without sacrificing their security. To fully realize the promise of safe home automation, though calls for a concentrated effort to resolve privacy issues, reduce security threats, and consistently innovate in this quickly developing industry.

Additionally, by presenting new techniques and insights from the combination of ML, IoT, and voice recognition technologies, this research study aims to further the field of secured home automation. Our main goal is to facilitate the creation of robust, intelligent, and user-focused smart home ecosystems by expanding knowledge of the fundamental ideas and applications.