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Face Authenticated Personal Virtual Assistant

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Abstract: ***In these days the technology has been increased rapidly. More number people are using the internet to make things simple. Our project is about virtual personal assistant (VPA). There are some Virtualassistants like Siri, Alexa, Cortana, google assistant etc. Virtual assistant takes commands or questions from user and perform the tasks according to The commands virtually or through the internet. Our virtual personal assistant had a features Like search engine, open apps, set timer, send email, send WhatsApp messages, navigation etc. The virtual personal assistant takes an input through voice (via microphone) and process the input and gives the output through systems speaker.But in our VPA it takes a voice input and give the voice output and it also displays an output on the screen.***

Index Terms: Virtual Personal Assistants (VPN), Machine learning, Haar cascade classifier, Tkinter module, OpenCV, speech to text.

I. INTRODUCTION

Nowadays the usage of virtual assistant has been increased. Every sector or organizations like banking, agriculture, Business like education, e-commerce etc. are been using a virtual assistant in their particular applications. And there are also a very popular assistants like Alexa, Siri, google assistant. But our virtual assistant is not a commercial assistant it's just a personal assistant means we can use it as daily routines like to read news, for playing a music or videos, to set a timer, use as a search engine, for sending messages through email and WhatsApp, to know the weather outside, italso cracks the jokes, it captures a photo, we can maintain a to do list, etc. The assistants like Alexa,google assistant, Cortana having some security issues that anyone can access it. This may cause effect to an end user.

A. Rationale

As we know the time is very important. For example, if we want to search any topic or play a musicwhile driving a car in this case we have to stop and we have to open an app and we have to search for it. So, it consumes some time to do this we have to stop a car and we have to so that task for this purpose we want to develop a virtual assistant which takes a voice input and it gives the output through a system speaker. Not only for the above example it works on different cases. By using this personal assistant, we can save our time.

B. Goal

Our goal is to make a Virtual personal assistant so that the end users can use it effectively and they can save their time by doing their tasks virtually using internet.

C. Objective

The main objective of your project to make people works smart and efficient



Fig 1. Machine Learning

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II. LITERATURE SURVEY

A literature survey on virtual personal assistants in machine learning projects would involve exploring research and industry publications that discuss the design, development, and application of virtual personal assistants (VPAs) powered by machine learning. Here are some key areas to consider:

1) *Machine learning algorithms and techniques for VPA development:* The literature survey could explore the various machine learning algorithms and techniques that have been applied in the development of VPAs. This could include natural language processing (NLP), deep learning,reinforcement learning, and other techniques.
2) *User interaction with VPAs:* User interaction with VPAs is a key area of research in the development of VPAs. The literature survey could explore user experience (UX) design and techniques that enable effective user interaction with VPAs, such as voice recognition, chatbots, andother interfaces.
3) *Applications of VPAs:* VPAs are being used in various applications, including healthcare, education, e-commerce, and customer service. The literature survey could explore the various applications of VPAs and their impact on these fields.
4) *Challenges in VPA development:* The development of VPAs is not without its challenges. The literature survey could explore the challenges faced by developers in the design, development, and deployment of VPAs, such as data privacy, security, and ethical concerns.
5) *Emerging trends in VPA development:* The literature survey could also explore emerging trends in VPA development, such as the use of chatbots and voice assistants in mobile devices, wearables, and other IoT devices.

Some key resources for a literature survey on VPAs in machine learning projects could include academic journals, conference proceedings, and industry reports. Some relevant journals include theJournal of Artificial Intelligence Research, Machine Learning, and IEEE Transactions on Neural Networks and Learning Systems. Relevant conferences could include the International Conference on Machine Learning (ICML), the Conference on Empirical Methods in Natural Language Processing (EMNLP), and the Association for Computational Linguistics (ACL) conference. Additionally, industry reports from technology companies such as Amazon, Google, and Apple could provide insights into the latest developments in VPA technology.

III. METHDOLOGY

A. *Machine Learning*

Machine learning is an area of computer science that allows computers to learn without having to beprogrammed directly. Machine learning is one of the most fascinating. technologies one has ever met. It provides the computer features that make it more human-like, as the name indicates.

B. *Packages Required*

Python has a large number of built-in modules which are used to develop a system. Here the list of modules required to develop our project.

1) *OpenCV:* OpenCV is an open-source computer vision library containing a large variety of algorithms published under the BSD licence. It's mostly used for image processing and analysis, such as face and object detection Installation of OpenCV: pip install OpenCV #Run this command in Python terminal.
2) *Speech Recognition:* Speech recognition is a python library which is used to recognise the voice input and process it into the text. Most of the Virtual assistants using this module.
3) *Pyttsx3:* Pyttsx3 is a python library which is used to convert the output text to the speech Installation of Pyttsx3 module: pip install Pyttsx3 #Run this command in python terminal.
4) *PyAudio:* PyAudio is a python library which is used to play and record the audio on a different platform likeLinux, Windows, Mac OS. Installation of PyAudio module: pip install PyAudio #Run this command in terminal.
5) *smtplib:* smtplib is a standard Python library which we can directly import it in the python program. smtplibis a simple mail transfer protocol library which is used to send a mail through python program.
6) *Pywhatkit:* Pywhatkit is a Python module which is used to send a WhatsApp message through python program. Some other Features of Pywhatkit Module: Perform a Google Search.Play YouTube videos.Get information for a particular topic Convert thespeech to Handwritten text. Installation of Pywhatkit: pip install Pywhatkit #Run this command in python terminal.
7) *Wikipedia:* Wikipedia Module in python is used to Search a topic from Wikipedia website.
8) *Geopy:* Using third-party geocoders and other data sources, geopy makes it simple for Python developers tofind the coordinates of addresses, cities, countries, and landmarks all over the world. Pip install geopy #Run this command in python terminal.

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9) OS Module: In Python, the OS module will deal with the Systems operating system. It is the built-in library inPython.

C. Contribution of System

1) Existing System

There are Already some Existing virtual Assistants like Alexa, Google, Siri, Cortana.

a) Amazon Alexa
b) Apple's Siri
c) Google Now
d) Microsoft Cortana

In the Existing systems there is a disadvantage that these assistants are less Secure. So, in Our Proposed System we have added a face unlock Feature.

2) Proposed System

In our proposed system we have added the features like:

a) Added a Face unlock system for High Security purpose.
b) According to the User Requirement they can switch the voice of the assistant From male to female and vice versa.
c) Covid Tracker.
d) If the system is not able to gather information from the user voice it will take through input astext.

IV. IMPLEMENTATION

Building a virtual personal assistant can be a complex task that involves a combination of different technologies and programming languages. Here is a high-level overview of the implementation process:

1) *Choose a programming language:* You can use any programming language to build a virtual personal assistant, but some popular choices include Python, JavaScript, and Ruby.
2) *Choose a natural language processing (NLP) library:* NLP is a key component of a virtual personal assistant as it allows the assistant to understand natural language input. Some popular NLPlibraries include spaCy, NLTK, and Stanford CoreNLP.
3) *Choose a speech recognition library:* If you want your virtual personal assistant to respond to voice commands, you will need to integrate a speech recognition library such as Google Cloud Speech API, Amazon Transcribe, or Microsoft Azure Speech Services.
4) *Choose a text-to-speech library:* To enable your virtual personal assistant to speak back to the user, you will need to integrate a text-to-speech library such as Google Text-to-Speech, Amazon Polly, or Microsoft Azure Text-to-Speech.
5) *Build a knowledge base:* Your virtual personal assistant will need access to a knowledge base to answer questions and perform tasks. You can build this knowledge base using a combination of datasources such as APIs, databases, and web scraping.
6) *Integrate machine learning:* Machine learning algorithms can help your virtual personal assistant to learn and improve over time. You can use machine learning techniques such as natural language understanding (NLU) and sentiment analysis to improve the accuracy of your assistant's responses.
7) *Build a user interface:* You will need to create a user interface for your virtual personal assistant so that users can interact with it. This can be a mobile app, a web app, or a standalone desktop application.
8) *Test and iterate:* Once you have built your virtual personal assistant, it's important to test it thoroughly and iterate based on user feedback. You can use analytics tools to track usage patterns and identify areas for improvement.

Overall, building a virtual personal assistant is a complex task that requires expertise in multiple areas of technology. However, with the right tools and approach, it is possible to create a powerful and user-friendly assistant that can help people with a variety of tasks.

Features we implemented in our project:

a) Face unlocks
b) Display date and time
c) Search tool
d) Mail sender
e) Directions
f) WhatsApp message sender

g) Know definition of words
h) Translate text
i) System info and battery info
j) Mathematical operations, etc.

V. EXPERIMENTAL RESULTS



Fig 2: First user needs to register his/her face by clicking on the Register Face button.



Fig 3. Registration of user

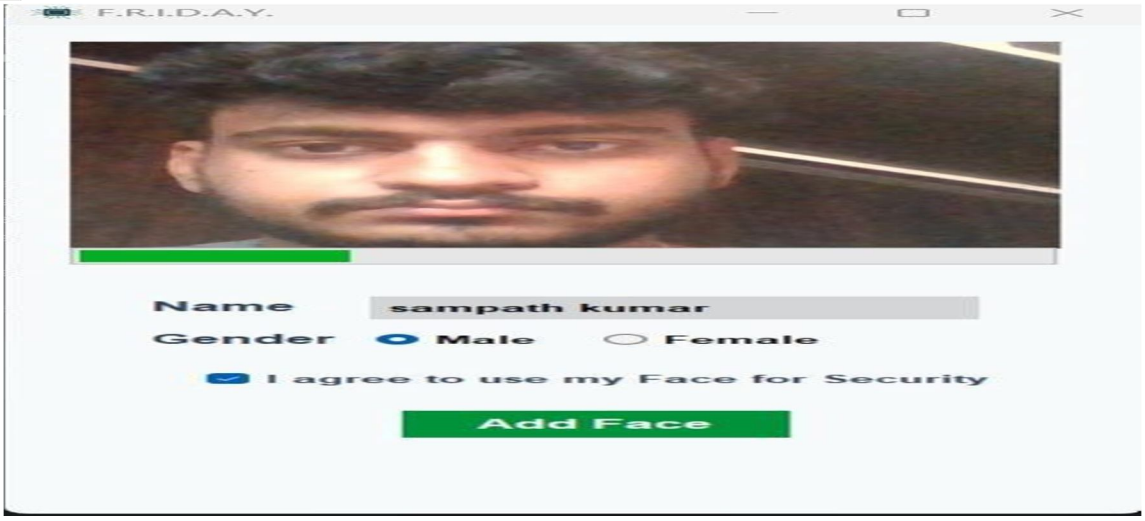


Fig 4. Acknowledgement of registration



Fig 5. Selection of Avatar

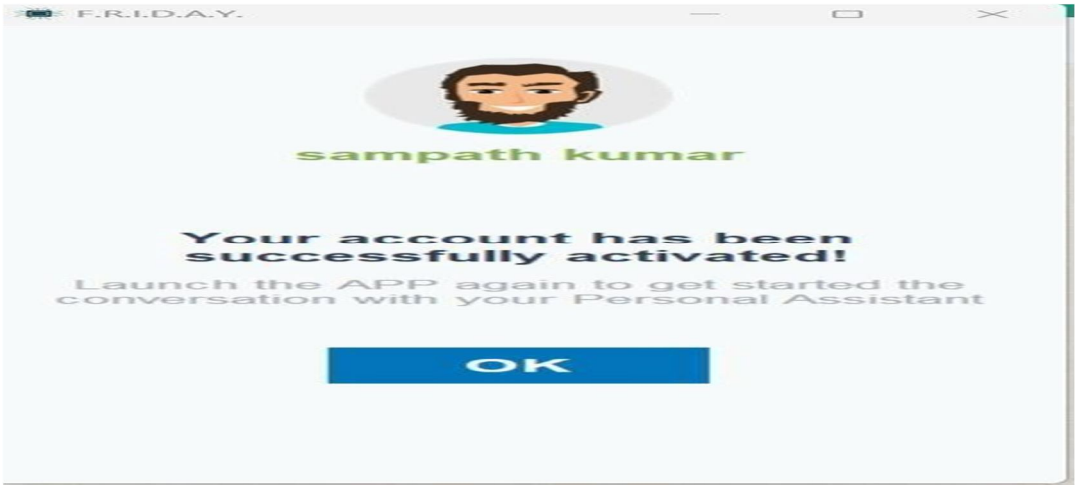


Fig 6. Acknowledgement of successful activation of user account

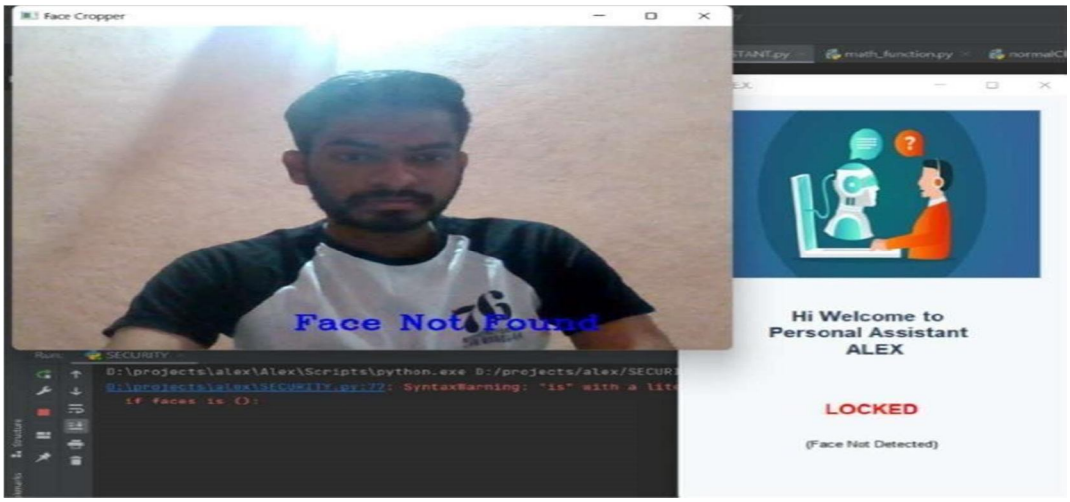


Fig 7. If face is not matched it will not unlock and display as Face not found or Locked.



Fig 8. If user face matched then immediately it will unlock and enter into vpa



Fig 9. Then user can ask queries through voice or give text through keyboard.

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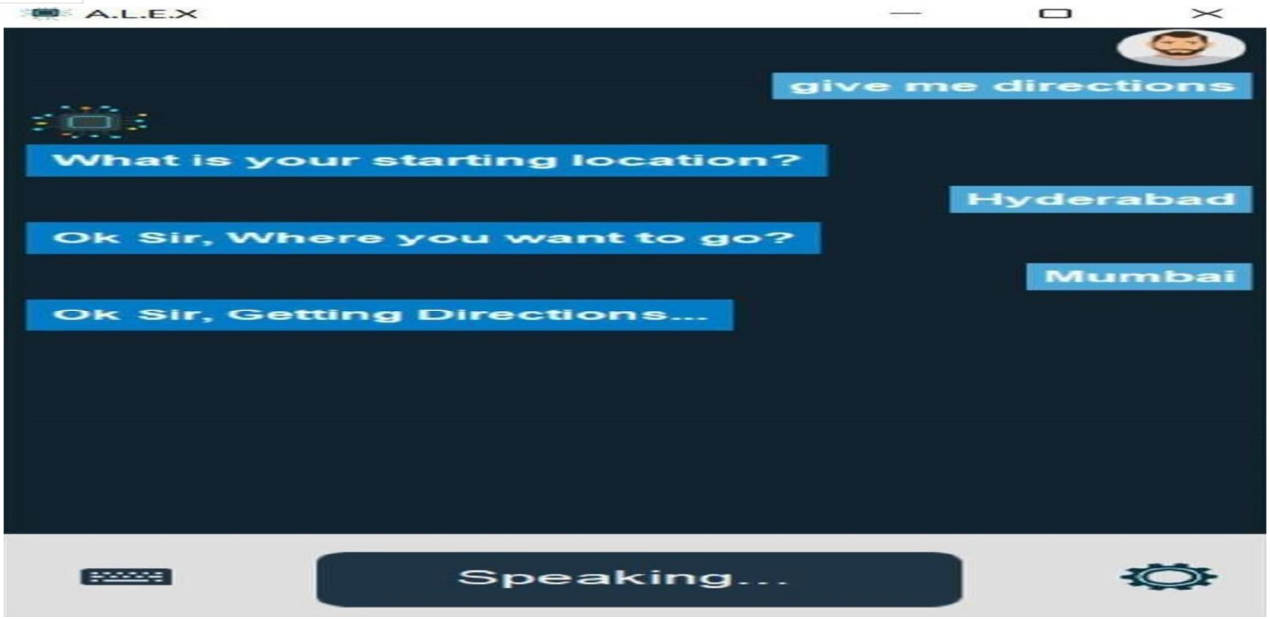


Fig 10. Query for asking directions

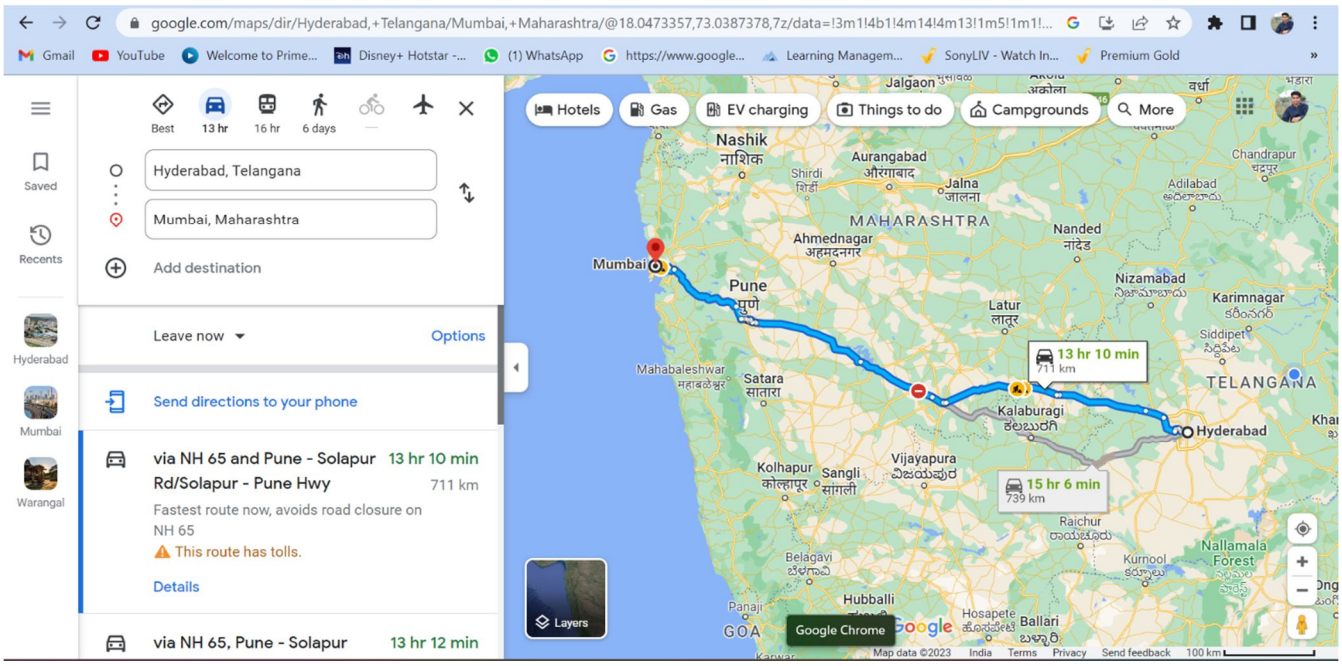


Fig 11. Output of directions

VI. CONCLUSION

Building a virtual personal assistant using machine learning is a challenging but rewarding project. The use of natural language processing, speech recognition, and text-to-speech technologies enables the assistant to interact with users in a natural way and provide useful information and assistance. Machine learning algorithms can be used to improve the accuracy of the assistant's responses over time, making it more intelligent and efficient. By building a knowledge base and integrating with a variety of data sources, the assistant can perform a wide range of tasks and provide valuableinsights to users. While the implementation of a virtual personal assistant may require significant time and effort, the potential benefits for users are substantial. The assistant can save time, increase productivity, and improve overall quality of life by simplifying tasks and providing valuable information. Overall, a virtual personal assistant powered by machine learning has the potential to be a powerful tool for individuals and businesses alike, and represents an exciting area of development in the field of artificial intelligence.

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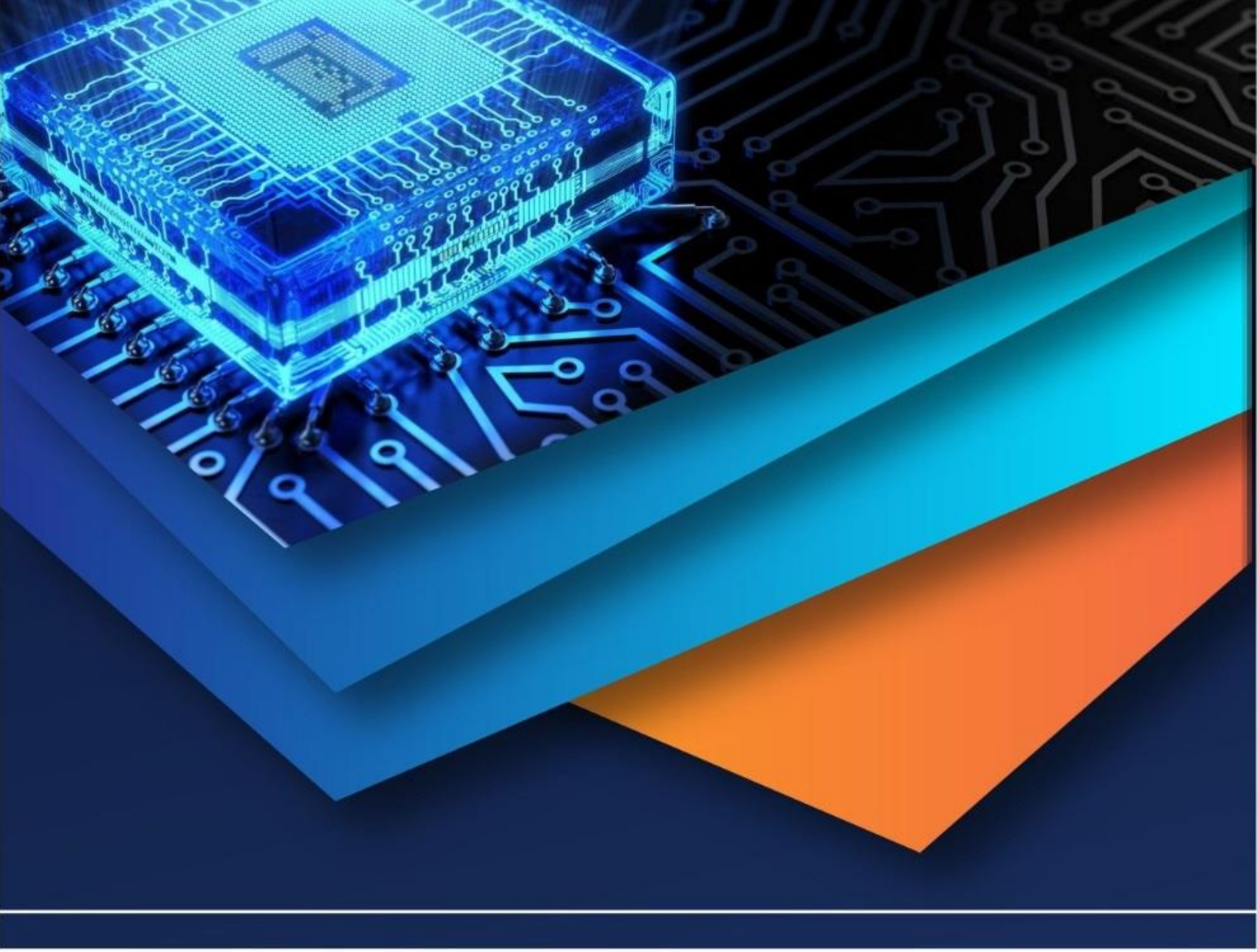
VII. FUTURE SCOPE

In future we will increase more security in the login process like.

1) Unlock through the thumb
2) Unlock with One Time Password (OTP)
3) Develop an Android Application for our Project.

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