Virtual Personal Assistant with Face Recognition Login System
Using Machine Learning and Artificial Intelligence

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Abstract:
PERCY-The Virtual Personal Assistant, is a web based application that is primarily aimed to ease a person’s life by helping him keep in touch with his surroundings anywhere, anytime around the world. The primary goal is to provide a secure login system consisting of two phases. The first phase is a simple username and password login and the second phase uses face detection login which is unique for every user. The concepts of Artificial Intelligence [1] like Machine Learning and Computer Vision comes into use in the second phase of the login system as the user has to first train the dataset with his picture to facilitate the facial recognition [8] [9]. After the Signup and Login is successful the Virtual Personal Assistant- PERCY becomes active and welcomes you to use its features. Some of the key features of the Virtual Assistant are: Real-Time Weather Report, News, To-Do list, Search and some Jokes and movie trailers for entertainment. These features are incorporated into the web application to help users in their day to day life. So the basic motto of this small web application Percy is to make life easier and fun for the user as well as keeping their data safe from unauthorized access by unknown people over the communication network as most of the Virtual Personal Assistants available in the market have loopholes in their security which can eventually lead to theft of data [11].

Keywords: Virtual Personal Assistant, PERCY, Machine Learning, OpenCV, Security, Two Factor Authentication, Automation Systems, Computer Vision, Face Recognition, Real-Time, Weather API

1. INTRODUCTION

Recently we have seen great rise in the number of Virtual Personal Assistants (VPAs) in the market which are being used for various purposes. These applications have already made a mark upon the world as they have reduced the complexities in various types of services and made operations easier. A Virtual Assistant is a software application that works as an agent which can perform various tasks or services based on some commands which can be inputted by either speech or text [2]. Sometimes people often refer it as ‘Chat Bots’ is it has an interactive interface. Some assistants are made for entertainment purposes and some for business purposes. Some of these are programmed to chat with the user through text only but some are enabled to interpret human speech and respond with synthesized voices [2]. While users generally have shown great optimism and excitement for these types of applications, nearly all pointed out that this is still in its exploratory phase. We have seen the emergence of various kinds of virtual assistants which have been continuously updating to perfect their user experience with various features. But most of these platforms suffer from security concerns.[11]

So the main objective of the project is build a Virtual Personal Assistant with multi-layer security so that the privacy of the user is not hampered as sometimes virtual assistants may contain sensitive data of the user.

II. RELATED WORK

We have gone through several virtual assistants and collected some ideas to implement these in my project. The features of top five similar applications that are well-known and appreciably used all over the world are listed below:

Google Assistant: Google Assistant is an Artificial Intelligence-powered Virtual Assistant developed by Google that is primarily available on mobile and smart home devices. Google has been known for its accessibility. You can get it on your phone, speaker, watch, laptop, TV, or in your car. It can connect to frequently used products or applications like Netflix, YouTube and Spotify. It can take voice as well as text input and give the same formats of outputs [2] [4] [5] [10] [13].

Microsoft’s Cortana: Cortana is basically a digital agent that is designed to learn from the user’s commands to personalize the user experience when it’s used later. It also can take voice or text inputs. It also provides similar features like managing calendars, chatting with the virtual assistant, perform searches, etc [5] [10] [14] [15].

Amazon’s Alexa: Amazon has done a really great work in the development of Alexa. This virtual assistant has got the ability to connect our entire life with some devices. Alexa is very popular in home automation systems as it can connect a large number of devices like lights, televisions and many other electrical appliances. It can also check weather, news and also connect you to latest music available in the market. Moreover it can also do shopping and book a cab for a user based on voice commands [2] [5] [6] [7] [10].

Apple’s Siri: Siri is one of the oldest virtual assistants available in the market. Siri can also take voice or text inputs.
and reply via same. It can give sports updates, news and weather updates, set reminders and alarms, text or call a person using the hands-free mode and thus making life easier for its users. It is available on all apple devices only [2] [3] [5] [10].

**Samsung’s Bixby:** Bixby is one of a kind virtual assistant. It provides all the regular features of a virtual assistant. But one of the coolest feature of Bixby is that it can identify landmarks and other visuals by just taking a photo. Also you can point your camera at an object and it will show you other pricing options. It also supports translations of various languages like the Google Assistant. It can also recommend restaurants and business nearby you and manage your schedule easily [2] [10] [12].

**III. RELATED TECHNOLOGIES**

The technologies used to build this project is listed below:

- HTML
- CSS
- JavaScript
- AJAX
- JSON
- Python3
- Flask Web Framework
- Machine Learning and Computer Vision

The above mentioned technologies have been used as these are easy to understand, write and also easy to integrate with each other. These are platform independent, compatible and open source. Flask framework has been used as it is easy to integrate all the above features through python code. HTML is a widely accepted web page designing framework as well as CSS. We have used the OpenCV library which is a python library that is used implement the Face Recognition in this project.

**IV. PROPOSED PROTOCOL**

![Proposed Protocol Use Case Diagram](image)

Proposed Protocol Description—The main objective of the project is to develop a Personal Virtual Assistant which can help and assist people in their daily life by providing the information needed in day to day life. After going through a short survey of the pre-existing projects in the market we were successfully able to create a small virtual assistant with some of the most essential features that affects a person’s daily life.

We have tried to improve the security level of the virtual assistant by implementing a facial recognition system, as security is the main concerning loophole in most of the virtual assistants available in the market today. As the User opens the website, he would have to register first with his name, username and password. After this he will be redirected to the face registration page. After successful account creation the user would have to login with his credentials and facial recognition after which he would be redirected to the homepage of PERCY which contains features like Weather Report, News, To-Do List, item search, Jokes and Movie Trailers.

**V. PROPOSED WORK**

**Step-1:** User has to register himself with his credentials.

**Step-2:** The user will be redirected register his face.

**Step-3:** The user will have to login with his credentials.

**Step-4:** The face recognition page opens up and the user is expected to show his face for login.

**Step-5:** After successful login the PERCY homepage opens up and shows the available features.

**Step-6:** The user will be shown the response results for his requests like weather report, news, jokes, search, etc.

**Figure 3. General Flow Diagram**

**VI. SOFTWARE USED**

The software used to make this project is listed below:

- Atom IDE
- SQLite DB
- Google Chrome

**VII. BENEFITS OF THE MODEL**

Some benefits of this project are as follows:

- Multi-Layer Security with Face Recognition Login System.
- Real-time weather reports with precise details.
- Free for lifetime.
- Hassle-free operation and very easy to use.
- Fast communication.

**VIII. FUTURE WORK**

With the knowledge we have gained by developing this web based virtual personal assistant, we are confident that in the
near future we can make the application more effective by adding these features.

- Speech to text implementation
- Nearby Object Detection
- Creating a mobile app
- Making the application much lighter
- Shopping facilities
- Cab Booking facilities
- Music on demand
- Activity monitoring
- Health Monitoring

IX. REFERENCES


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