

Intelligent Personal Assistant

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Abstract

Intelligent Assistant has become an important need for technologically ahead society. In such a motive, we propose IPA, a software agent that can perform tasks and services based on verbal commands. The basic idea is to provide accurate support for various daily aspects of living through a simple but powerful system. The system ensures complete security for personal likes and dislikes against other important details like credentials. The system uses classification and regression Machine Learning algorithms to gather results and basic chatterbot system which will act as a perfect companion for humans. The system aims at providing assistance for travel, sports and statistical analysis, basic knowledge from web.

Keywords: IPA, Chatbot, Machine Learning , Regression ,Incremental Learning

1. Introduction

People worldwide are all now connected by the Internet. As of June 2018, the internet users over the world was 4.2 Billion among 7.6 Billion which is almost 55% of total population, which itself is a big number[1]. Roughly in one moment there will be tens of thousands of new Facebook posts, thousands of new tweets and applications downloaded. Since the Internet is generally accessible, only one moment of worldwide online action is jam-stuffed brimming with occasions, from correspondence with others to information stockpiling to diversion alternatives in abundance. The proportion of data moved to the Internet in a singular second is staggering.

Intelligent Assistant has the skill to comprehend natural language and learn the user's dialect, adapts to user's lifestyle and requirements and also has the ability to maximize smartphone's capabilities. They basically provide administrative services to users while operating outside the user's office. Also, as it works offsite, there is no need for a desk at the company's office.[2]

A voice assistant has detonated in popularity in recent years and now comes pre-installed on most smart devices. A voice assistant jumps into action at the mention of a keyboard. They can connect to the Internet to find out pretty much any piece of information whether it is how much the Earth weighs etc. The voice assistant uses natural language processing to decipher what is said and then react accordingly.

2. Background and Related Work

The virtual assistant industry now prevails together of the foremost wanted and beneficial jobs that promises companies returns on investment and high pay and a work-life balance. The mounting of virtual assistants didn't happen overnight, but during an extended and sophisticated transition. Sir Isaac Pitman's invention of the shorthand method led to the creation of secretarial services as a practical profession..

It cannot be denied that professional virtual assistants are in high demand lately . As small businesses and start-ups look towards scaling, they're realizing the large amount of returns that hiring virtual assistants pose. Among the varied benefits that companies can gain from hiring virtual assistants include:

1. Taking stock of valuable time to grow your business and do what you love;
2. Getting obviate long-term contracts;

3. Having access to a gentle stream of competent professionals;
4. having the ability to settle on the choice of scaling up or down;
5. Trimming costs from insurance et al. .
6. Cost-effective.

Technology modernised traditional work to interrupt time and distance barriers. When the secretarial services industry gave rise to “virtual” assistance isn't definitive., but what's certain is that technology made it possible. the phonephone and fax machine helped bridge people and workplaces thousands of miles apart. During the 1980s, administrative assistance began being delivered remotely. Then, in 1994, the online became a popular medium for businesses to make transactions from long distances.

3. Problem Definition

The main drawback of the human personal assistant is that it cannot work outside the office, also the cost maintenance is high. Moreover, they cannot provide assistance whenever the users need and also the assistance provided by them are not always totally reliable. The privacy concern is one of the major issues of a human personal assistant. Data can be lost and there are no ways to recover it once lost. Henceforth in a long run, human personal assistants do not play a significant role and there is a need for a virtual personal assistant.

4. Proposed Methodology

Therefore, we propose a device that acts as an activity organizer, to provide a variety of services to its master, [6]which consults all the instances of intelligent programs with natural language processing that are currently available , with different categories of support and examine the potential usefulness of one specific piece of software as a IPA. It continues to extend its digital abilities in organizing events, ordering food, playing music, guiding services for travelling, game prediction etc.As artificial intelligence and machine learning progress at pace, digital assistants are set to become our gateway to the internet and know more about us than we do ourselves.

5. Implementation

The system begins with accepting user speech as input audio. It then compares the audio with the conditions of the voice assistant. If audio matches any of the condition appropriate functions are invoked and therefore the results displayed on the output screen. Following terminologies are related to the implementation of the system:-

A. Gaussian Naïve Bayes

The Gaussian Naive Bayes is a classifier model. Beside the Gaussian Naive Bayes there also are existing the Multinomial naive Bayes and therefore the Bernoulli naive Bayes. [7]

$$P(A|B) = \frac{P(B|A)(P(A))}{P(B)}$$

Figure 1. Representation of Gaussian Naïve Bayes

B. Random Forest Classifier

A machine learning algorithm that generates even without hyper-parameter tuning. Because of its simplicity, it is used for both regression furthermore as classification. [8]Random Forest could be a supervised learning algorithm. It produces a forest and makes it random, an instance of Decision Trees trained with the “bagging” method. The concept of the bagging method is that a mix of learning models increases the result.

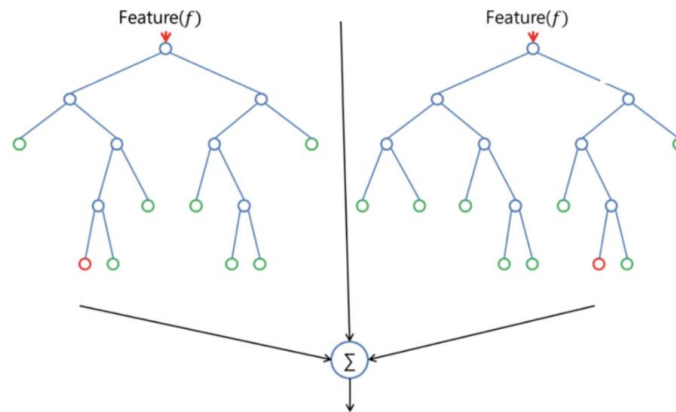


Figure 2. Random Forest Classifier

They are used to add randomness to the model, while growing the trees. It searches for the best feature among a random subset of features, resulting in a wide diversity that results in a better model.

Following are some snippets of the output:-

I am ready for your command
I am ready for your command
You said: hi I am Siddharth

I am ready for your command

Figure 3.

You said: how are you

I am fine, thank you.

Figure 4.

6. Conclusion

Intelligent Personal Assistants are more portable and reliable than human assistant and can be used anytime. Although the capability to instruct devices to perform tasks via voice commands has been available since the 1950s [10] It is only in the last few years that the procreation of smartphones made voice interfaces accessible to users worldwide. The concept of intelligent assistant which is a digital service looking after a range of our needs is fast becoming a reality. As Artificial Intelligence and Machine learning progress at pace, digital assistants are set to become our gateway to the Internet. However, despite their widespread availability, robustness and speed, the number of people who use personal assistants are relatively low.

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