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REVIEW ARTICLE

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ECOMMERCE BASED ONLINE SHOPPING FOR VISUALLY IMPAIRED PEOPLE USING SPEECH RECOGNITION

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ABSTRACT

For Visual impaired people it is difficult to do online shopping. We are developing system which helps blind people to choose color of clothes along with categories such as material, size, patterns etc. by using Automatic speech recognition module. It , translating of spoken words into text using deep learning method. It successfully replaced Gaussian mixture speech recognition and feature coding at an increasingly larger scale. The main aim of this project is to propose an online shopping application especially for blind people through which they can choose whatever they want by simply speaking a sentence and to implement this we are going to integrate deep learning method and clustering.

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INTRODUCTION

According to WHO, there are around 161 million people who are visually impaired people and around 36 million are blind. These people are taking help from family member or friends to each and every for their needs. It is a difficult for blind people to choose clothes with different colors or they find difficult to online shopping. A system is developed to assist blind people that automatically recognizing clothing patterns and colors. Camera-based clothing pattern recognition is a problematic due to many clothing pattern and corresponding large intra class variations. Existing texture analysis methods focus on textures with variations in viewpoint and scaling. The level of accuracy in clothing pattern recognition cannot achieve by texture analysis methods. Here, we introduce a system to assist color blind people to select different clothing colors along with different categories. The system contains three major components: 1) database which contain clothing images, a microphone for speech command input 2) speech converter that convert the input speech into text format 3) display of resulting items on the screen of desktop or wearable computer along with speech. The system process the voice input, captured voice input is acoustic sound waves that are to be converted into the character string format for semantic interpretation. The result of character string format obtained is then proceed for the global and local feature identification, global feature such as the gender and category, category such as pant, sari, dresses, shirt and so on while the local feature such as red pant then the red is the local feature of the global feature pant .Conventional speech recognition systems use Gaussian mixture model (GMM) based hidden Markov models (HMMs) to represent speech signals. HMMs-based speech recognition systems can be trained automatically and are simple and computationally feasible to use. However, one of the main drawbacks of Gaussian mixture models is that they are statistically inefficient for modeling data that lie on or near a non-linear manifold in the data space. We are using Deep learning, sometimes referred as representation learning or unsupervised feature learning, is a new area of machine learning.

Deep learning is becoming a mainstream technology for speech recognition and has successfully replaced Gaussian mixtures for speech recognition and feature coding at an increasingly larger scale. In the course project, we focus on deep belief networks (DBNs) for speech recognition.

REVIEW OF LITERATURE

A system is being developed for visually impaired people to improve the life quality and safety of such people. Rubi,chhavi rana (Lowe, 2004) discussed deep learning algorithms such as Deep Belief Networks Deep Convolutional Network ,Restricted Boltzmann Machines and models such as The multi-model learning that are used in speech recognition and also discussed about the software that are required to implement the speech recognition in java language. Xiaodong Yang (2012) proposed a system for blind people through which they independently select clothes based on cloth pattern and colors in a cloth shop. This system consist camera that can handle clothes with fuzzy pattern and recognize clothes into four categories and identify 11 colors: red, orange, yellow, green, cyan, blue, purple, pink, black, grey and white.

FAIZ .M. Hasanuzzaman developed a system to automatically recognize banknote of any currency to assist visually impaired people. This is also a camera based computer vision technology. This system has features like high accuracy, robustness, high efficiency, ease of use. This system is robust to conditions like occlusion, rotation, scaling, cluttered background, illumination change, wrinkled bills, and also eliminating false recognition and can guide the user to properly and correctly focus at the bill to be recognized using speed up robust features (SURF). Dimitrios Dakopoulos and Nikolous developed a vision substitution system for travel aid for blind people. Out of the three main categories of navigation systems (Eectronic Travel Aids, Electronic Orientation systems, Position Locator Aids) here the focus is on Electronic Travel Aids. Yuan et al. (2007), proposed a system to help the blind people to match clothes from a pair of clothing images. This system can favor a user with the information about identify the clothing patterns and colors match. But, this system is still not able to automatically identify clothing patterns.

Multi-fractal spectrum (MFS) proposed by Xu et al. (2007). Density functions and orientation templates are used to group the combined fractal dimensions of pixel sets. In order to make representations of texture more strong to 3-D image transformations and changes in the illumination, many of the recent techniques provides information on extracting local image features. Clustering the extracted local features generates the texton dictionary. However; properties of an image in different aspects are captured by multiple features. If different features are highly interrelating, their combination will enhance the feature representation Lazebnik et al. introduced a texture representation method depends on affine-invariant descriptors and detectors (RIFT and SPIN). Zhang et al. also linked the scale invariant feature transform (SIFT) and SPIN for texture classi cation. An exhaustive comparative study of existing accessible shopping systems for blind and visually impaired people was carried out by Kulyukin and Kutiyanawala in 2010. ShopTalk (2007) is a wearable solution that requires the user to carry a barcode scanner and a UMPC in a backpack. Verbal route instructions are issued through a headphone connected to the UMPC at the blind person's backpack. Although the supermarket does not need to install and maintain any hardware, the system requires access to the supermarket's inventory control system and binding of product barcodes into supermarket locations so that guiding can be accomplished. The advantage of BlindShopping is that it only demands a lightweight smartphone equipped with a camera to read QR Codes attached to shelf sections and the very blind person's white cane enhanced with an off-the-shelf RFID reader. The Tinetra (Nicholson et al., 2007) project offers the possibility of detecting products via a barcode or RFID reader, and then it obtains related information via GPRS from the server. How- ever, it does not include a guiding system as BlindShopping. Similarly to us they use Baracoda's Pencil2 to scan barcodes and IDBlue to scan RFID tags.

PROPOSED SYSTEM

The proposed system is "Ecommerce based online Shopping for Visually Impaired People using Speech Recognition". The main aim of this objective based application is to enable the handicapped specially visually impaired peoples to access the ecommerce based platform which are most widely used for online purchasing of items or products now a days. But it is quite challenging task for visually impaired peoples to use this ecommerce based framework for online shopping. Hence in order to allow handicapped peoples specially visually impaired peoples to use this ecommerce online shopping site for purchasing of products without any limitations we are developing an ecommerce based application using speech recognition to eliminates or reduces the various practical difficulties that the visually impaired peoples come across.

In our proposed system we are using speech recognition for searching of products. this speech recognition can be carried out using Deep Learning Algorithm. This method of accessing or using speech for searching of product instead of using keyboard provide an extra advantage to visually impaired peoples and allows them to use the application with more flexibility. In order to search any product the user must be the existing member of website to Login. If the user is not the existing member he should Sign up first and then user will be allow to Login into the website by single stage authentication using password created by user. In order to search any product the must provide the voice input to the system. This voice input is in a form of acoustic waves. The system should recognize this input acoustic voice signal and converts this signal i.e. speech input signal into character string using Deep Learning Algorithm. The user communicates with the system using audio input. The speech recognition algorithm i.e. Deep Learning algorithm has to process the acoustic waves to transform into character string for further operation. Once the input speech signal are converted into character string the resultant character string are analyzed. According to the resultant character string analysis. The item of interest or searched item is selected from database to display as the searched result. After the required searched item are display on screen with an audio based voice command will elaborate the visually impaired peoples the product that display on a screen. In our proposed system since there are thousands of products along with their categories there are lots of entries into the database. Hence to provide more flexibility and compatibility we are clustering a data and this clustering of data can be carried out using K-mean Algorithm. The clustering is a method of finding groups of similar object in dataset.

The K-mean algorithm uses iterative method to gives result. The input to the algorithm are number of clusters 'K' and a dataset.

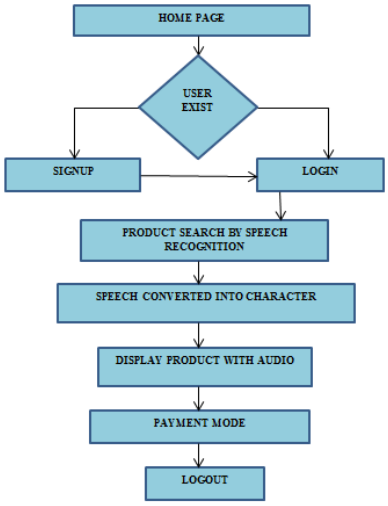


Fig. Flowchart of the system

Modules

Signup (For New users)
Login (For Existing Users)
Search Product Using Speech Recognition
Display Product by Product Category
Pay Pricing
Logout

Modules Description

Sign up (For New Users): New user can sign up at this part of project. Here user means client who enters into the website.

Login (For existing Users): This part of the project is for previous clients of the site. The user who are already registered at here they can login and view the related things to themselves and they can do the shopping over here.

Search product using Speech Recognition: This is the main section of the product where the user can search there required products using various categories with the help of speech. The system is now ready to take speech input given by the user. The system should be able to recognize and capture this voice input. The voice input are signals that are in the form of acoustic waves that are given to the system. These waves undergo conversion into character string.

Display Product by Product Category: This section of the project will display the related products searched by the user.

Pay Pricing: After purchase of the product the user can pay there related amount of product at this part of website.

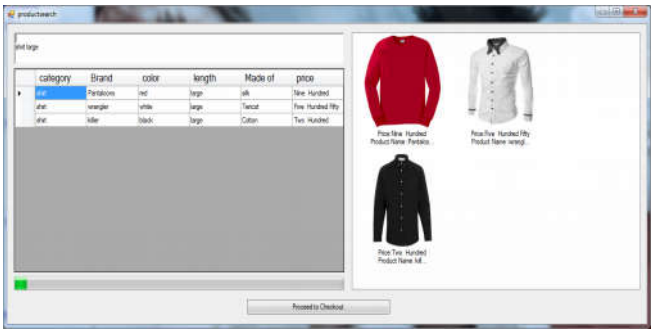
Logout: After purchasing the user can terminate his session with the help of this section.

RESULTS

Login : After opening the website the user must first login into his account using suitable username and password

User Section: After successful Login the Home page may get open. Where the user can search his product of interest using speech input.

Product Display after Search: After searching product using speech recognition the related product are displayed on the screen with audio defining the searched product.



Conclusion

There are many different segments available for online stores, which are effected by constant evolutions. To meet the new challenges and requirements of the market, the business owners need to think and make better decisions. we are developing a system for visual impaired people so that they can do online shopping. The system accept speech convert it into text format and display the desire result. This will help blind people to lead an independent life. In this course project, typical deep learning algorithms, including deep neural networks (DNN), and deep belief networks (DBN) have been implemented for speech recognition, Global, local feature are used for identification and multilevel clustering is used to increase the accuracy of system. Also the performance evaluation of the assistive can validate the resulting performance of the system.

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