Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 3, June 2021:41 - 49

Research Article

Covid Free Challan Form Filling System

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Abstract

Banking plays a vital role in human economic activity. In the context of COVID -19 pandemic, banks need to ensure and serve better to their customers by use of many digital tools and new products and services. In recent years the applications related to banking had been made simple and easier for the society with the facilities provide in online banking system. Any kind of services can be accessed by an individual to an extended range of services. Yet there exists people who are unfamiliar with the technologies that are used for processing online bank applications. Disabled persons and senior most citizens feel complex to fill the various bank related forms like for money deposit challan, moneny withdraw challan. The proposed work aims to overcome the issue faced by the various types of banking customers while filling different types of forms. The exploration of the research work is developing a modularized framework for form filling application through speech interface. The application done with help of few integrated modules. Module for recognize object, speech to text module to decode and making it a verified transaction with a feedback mechanism.

Keywords- Text-to-speech;Speech-to-Text; SpeechRecognition,Perturbation elimination,Haar-feature-based cascade classifiers.

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Received Accepted

Introduction

For every bankingcustomer service has great significance. In India there are many private and government undertaken banks each of them has many branches. Banking plays important role in delivering financial services. The banking availability coverage has been expanding day by day, the quality of customer services has became huge pressure for many of the banking sector and some time they fail to handle the expectations of the customers

The ratio of senior citizens persons in india's population increasing in the last few years. Elderly people are in the position to access the bank often for money transaction because most of them are pensioners. Also Nearly 15 % people from the total population suffering with numerous impairment; some of them are visually impaired or impotent to use their hands efficiently due to these they are facing barriers and expecting others assistance to fill their bank chllans. It is hard for them to depend on some people all the time. Also, a visually impaired person is felt difficult to access banking services in self.

In the view of helping senior citizens and the purblind community make banking services easier,the proposed research work for developing and deploying speech interface for form-filling application which replaces the traditional paper pen approach that too in order to provide Covid free challan filling system.

Related Work

H. Ghadage et.al (1) proposed work is for Multilanguage speech to text conversion system.the conversion in this work basically based on information in speech signal. In communication speech is important form for human being. The system takes input as human affirmation and produce the equivalent words as a result.

Zhemin Tu et.al (2) in this work speech recognition based on client-server mode is presented. Java applet used for recording the voice at the client side and once recorded, speech file send over the internet to the server computer and text related to the speech is displayed back to the user.

R. Marin et.al (3) In this research work converse about how speech recognition module has been implemented and how the translation between voice input and the text carried out with existing web robot. The technique introduced the steps for how to run over the internet, and the implementation part between speech recognition and the robot controller.

B. Raghavendhar Reddy et.al (4) past several decades speech recognition used for various extended applications like mobile communication to automatic reading machines. This work tells generally speech regognition based methods reduces the overheads caused by other methods of communication. The method is not used much in engineering field sue to the complexity and variety of speech signals and sound

Tan Lee et.al.[5] the work concentrated tone information for continuous speech recognition. Boundary segmentation methods were used in this work to recognize the Cantonese dialects and speech patterns .various Markova model used based on the tone modelling.Accuracy achieved here is 54 % with the help of wide normalization. Context dependent models achieved a accuracy of 60%.

Tejas Godambe [6] uses some statistical models for speech synthesis. Generally most popularly hidden Markov model used for speech synthesis. Found that Markova model produces better results with the hybrid models. Hybrid models had hidden Markov models along with essence based voice conversion techniques. The main aim of the work to reducing the over smoothness of speech synthesis model

Problem Statement

In country like India there are totally more than 34 banks and each bank have various number of branches even in singular town adequate number of banking accessible Most basic mode accessible in banking for filling structures is paper pen technique .the client need to fill their subtleties in different sorts of structures like cash move structures, check saving structures, withdrawal structures and advance application structures it is monotonous to recollect all these various kinds of structures for older and individual with inabilities. All the above said class will endure and once in a while they need to look help from others. It may delay their banking activity also some time they may get misfortune experience.

Implementation

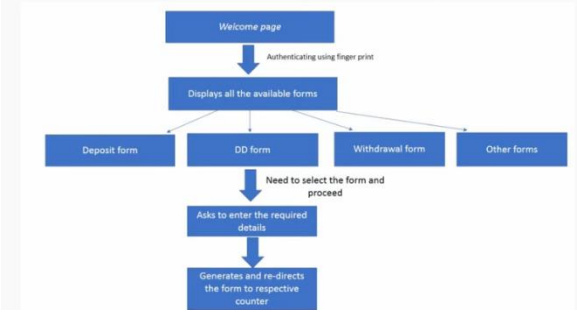
In our exploration work, we will make a sans covid challan composting machine for the community. Speech recognition technology has gained momentum in recent years. It provides advantages on both an individual as well as enterprise level. Amongst the various benefits, the most notable is its ability to dictate speech and convert it into texts. With its help, users can fill forms and perform multiple functions without any physical contact with the device.

This machine will automatically fill the form based on the speech interface. Speech interface is one of the artificial computations of providing an audio instruction, based on the user's form filling context and converting the user's speech into text and filled in the particular text field of the form using the module speech recognition in python. The system will convert speech to text and text to speech. The entire work divided into different modules.

a.object detection
b.voice based assistance
c.speech Recognition
d.speech to text conversion
e.authentication

A web application “COVID FREE CHALLAN FORM FILLING (CFCFC)”, which can accept the commands from user without any keyboard or physical activity (touch,etc).this is

possible with python library which needs to be included in the code. A user can repeat the highlighted text displayed over the screen, and the CFCFC will take appropriate actions. This application is boon for the old age and disabled users who find it challenging to complete their banking operation. This can be extended for various other registration or filling necessary forms like adhar card,pan card,railway reservation etc..



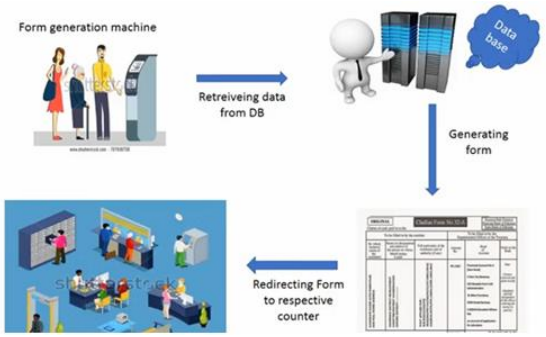


Figure 4.1 Covid Free challan form Filling process flow

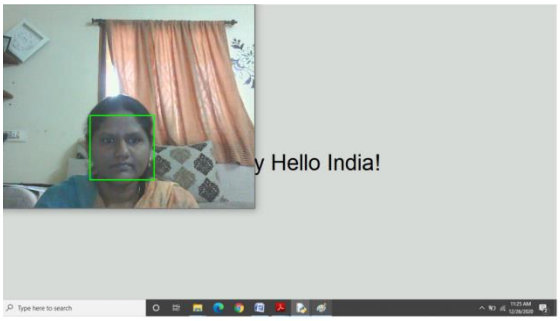
Object Detection

This is the first module of system. This module will authenticate the user. Various authentication methods available Password-based authentication, Biometric authentication etc., generally for biometric scanners are costlier need to spend more initial cost for the scanners. In this work low-cost alternative identified and implemented. Face recognition done using simple webcam. The algorithm here used for face recognition is based on facial feature extraction like facial coordinates using FaceNet model and more attributes such as skin color, models on face etc.

Customers face was acquired through a web camera. Object extracted from the captured continuous frames. The object is detected using Haar Cascade classifier algorithm. Which is machine learning based object detection algorithm. Where a classifier trained with a lot of images. This classifier is then used in detecting object in an image. Frame will be captured for 10 seconds and captured frame will be converted into gray scale images.

OpenCV used for image detection.the library comes with a lot of pre-trained classifiers. There are few classifiers for simle, face, nose, eyes etc.These classifier generally comes in the form of stored XML file.XML files are located in the location opencv/data/haarcascades/ folder. The XML files are downloaded from the link and placed in the “data” folder.

Once object detected from the image the application triggers voice assistant to assist the customer to fill their application. In case if the object is not detected from the captured image sequences then again through web camera customer images will be captured and object detection will be carried out. Till identification of proper object the web camera captured new sequence of images every 10 sec once.

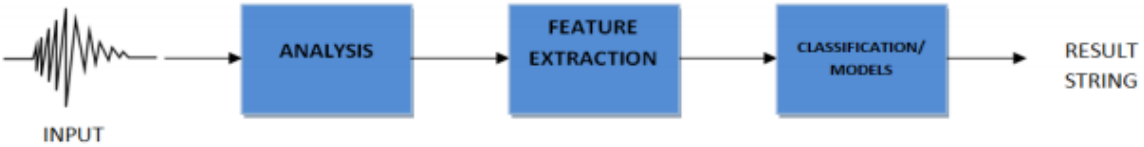


4.2 Object detection

Recognition of Speech

Speech recognition is sub field of computer science. Many speech recognition engines and APIs, together with Google speech engine, google cloud speech API, Microsoft Bing Voice Recognition and IBM Speech to Text supported by Python.

The module speaker recognition system may be viewed as three stages. The input is given to the system initially and pre-processing tasks are done to analyze the input. In second stage of speaker recognition system feature extraction and classification of speech is done to produce the resultant output in the form of string .the model illustrated in Fig 4.3



4.3: Process of Speech Recognition

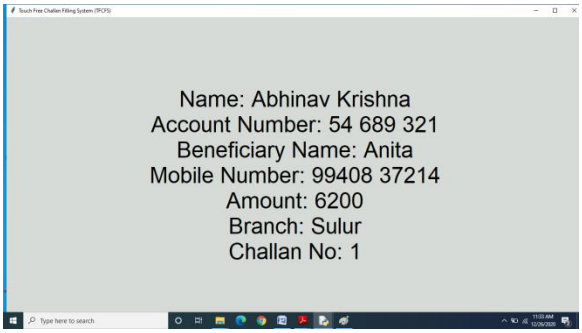
This module useful to convert user given speech input into text. This module can able to get input in any regional language.

The user assisted with the voice to fill their information. With the help of assisted voice users fill their information required for various banking operations like money transfer, Deposit form, DD form, withdrawal form, and other forms.

With the help of speech regongization API the user input analyzed and given to the module text to speech. This is used for converting given speech input to text for form filling process.

The user requires to fill the mandatory information required for carry out their banking process such as name of the customer, account number,beneficiary name,amount need to be transfer branch in the case of moneny deposit.

While filling the form through voice input if suppose the user accentuation not recognized by speech recognizer then the customer are request to input their information again until speech API recognition the process will be repeated.

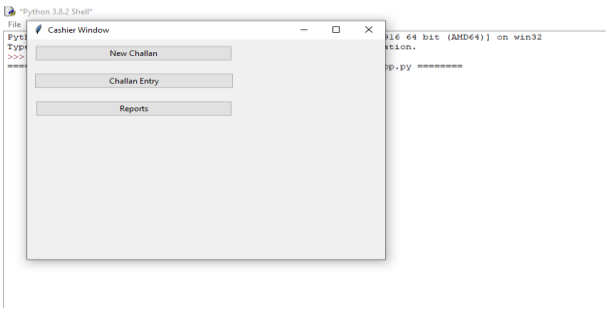


4.2 Token Generation

Cashier Application

Cashier application

The module is useful at the cashier end. Once all the information filled by the customer the token number will be generated based on the token number the further banking process will be carried out this will avoid unnecessary queuing in the bank also ensure the fair treatment among the customer. The token method already exists in current scenario.



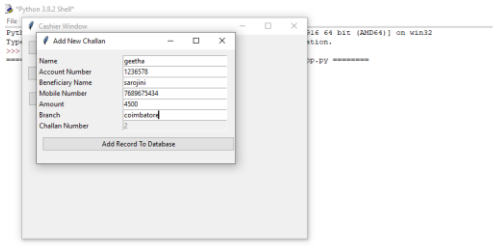
4.3 Cashier Window

Cashier window contains three options it facilitate the cashier to enter the new challan to the person with speaking disability who can't able to fill their form based on voice inputs can benefit through the new challan entry option.By clicking new challan tab the cashier able to make entry for the customer whom seeking help from the cashier side.

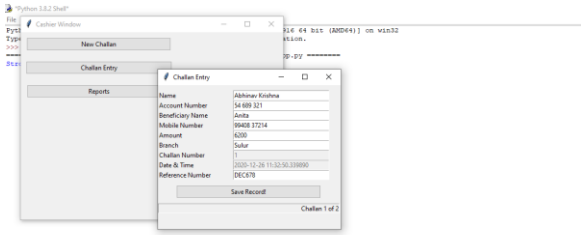
Once all the information feed by the cashier the token number generated and process will be carried out based on the token number.No overlooking is possible by the cashier due to automatic token number generation.which make useful in treating all the customer fairly.

The next filed of the challan entry is for viewing what are the forms filled through TFCFS application. Cashier can view the filled customer application and process their request. Reference number can be added by the cashier in the challan filled by the customer. Reference number is required to identify the transaction uniquely. The same reference number is forwarded to their mobile number for further processing.

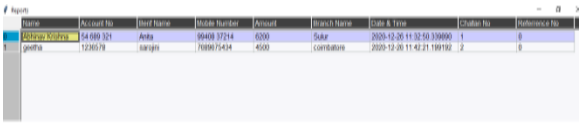
Various way of report generation possible in this The cashier also can take the reports day wise or month wise using report tap.



4.4 *Add New Challan*



4.5 Challan Entry



4.6 Report generation

Challanges

The main challenges of designing object detection in the dynamic environment is big. Some of the main challenges are lighting, the presence of shadow, motion of the object, weather condition etc.

The other challenging factor of the application is designing quality speech recognition system. The difficulty classified in number of categories Size of the vocabulary. Speaking mode, Speaking style, Type of noise , Microphone characteristics.

The other influenced factor of the application is internet facility. since the application using online speech API for the speech to text and text to speech conversation expected good bandwidth availability. Many times difficulty to ensure the same

Conclusion and Future Work

Voice based challan filling system enable an easy way for all kind of banking services. Although the growth of internet's, The telephone network is widely available and readily accessible. But still there are people who have less awareness of all these facilities. By using the proposed application the illiterate people can easily get the services even is they are not aware anything about the technology and system is very flexible for the nave users.

The system is mainly focused various form filling for the bank environment. The same methodology can be used in various form filling fields like railway ticket reservation, Adhar form filling, PAN application, hospital admission, schools or colleges admission form and many more. The main objective for this kind of application is to help three different category and which help in saving more time for the customer. The application can be extended withvarious security schemes to secure the data from third party access

Features

- The aged, illiterate and physically challenged people can fill the banks forms by their own.
- There will be fewer chances of mistakes in filing up forms as everything is automated.
- As it also generates token number, there will be no need to wait in longer queues.

- This is totally based on the local language so that there won't be any inconvenience in using this service.
- It reduces the paper usage
- It automatically authorizes the data without manual interface and it will sends the generated form to corresponding counter with token number

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