

Indian Institute of Technology, Guwahati



Department of Computer Science and Engineering

Project report

On

“Voice Based Search Contact List”

Based on

Speech recognition system

Course: CS566 Speech Processing

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ABSTRACT

Speech based contact search provides speech based solution to search contact and display details of contact. It uses the concepts of the Hidden Markov Model to store the speech phenomenon and compare the new sample of the speech data with three seconds with the existing HMM models to detect the word spoken

ACKNOWLEDGEMENT

We feel a deep sense of pleasure to acknowledge our gratitude to Prof. Pradip K. Das who gave us an opportunity to undertake such a great challenging and innovative work. We are grateful to the TA's for their guidance and insightful support in the development process. Last but not the least we are greatly indebted to each and everybody who has been associated with the project at any stage but whose name is not found in this acknowledgement.

INTRODUCTION

1.1 Project Overview:

Our project consists of a voice based search, where user can speak contact name and application will display its contact information. User can also add new contact. Vocabulary used in this Speech-based Project consists of names of people. Speaking the name will recognize the word spoken and will display his/her contact details. It uses Hidden Markov Model to recognize the name. Hidden Markov Model is a probabilistic model used to derive the probabilistic characteristic of any random process.

1.2 Purpose:

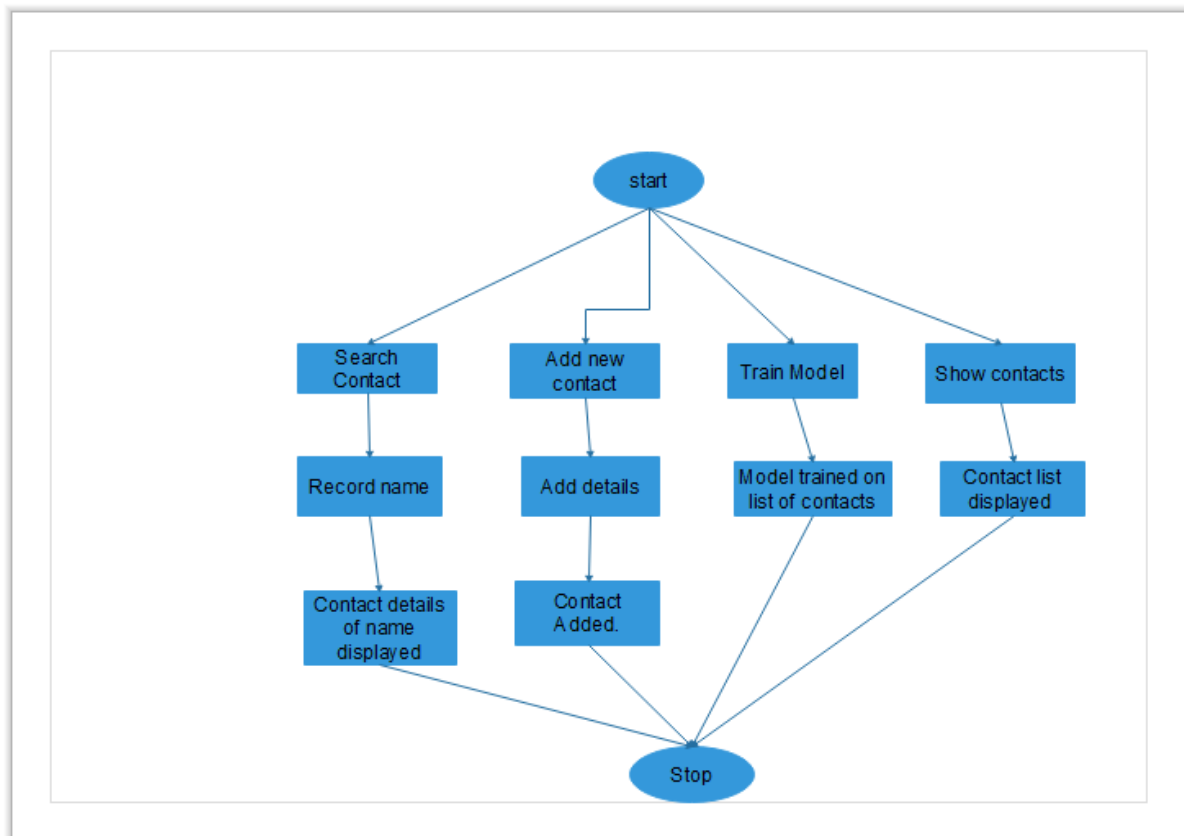
The main goal of this project is to recognize speech with a good accuracy. A variety of names in training set is used to build a good efficient model.

1.3 Limitation and Future Enhancement

The model is trained on a sample of 10 names. It can be further extended to a bigger dataset and to train these words runtime for new speakers.

2.Functional Design of system

Following is flowchart for search contact list application



3.PROJECT IMPLEMENTATION

3.1 Implementation Environment:

The code is implemented in Cpp language

Project is implemented using following hardware and software requirements:

- Microsoft Visual Studio 2010
- Command Line recording module
- coolEdit 2000
- Microphone

3.2 Module Specification and flow

Following are the modules:

Training

➤ Dataset creation

Model is trained on 20 utterance of each name .10 sample names are used for training. Names capture wide variety of speech utterance. This dataset forms the universe.

➤ Text preprocessing:

Each utterance files is preprocessed by implementing DC Shift ,Normalizing data, extracting the part of speech where actual word is said, feature extraction by calculating cepstral coefficients

➤ Codebook generation :

Codebook of size 32*12 is build using LBG algorithm and is used to capture discrete representation of speech sounds.

➤ Observation sequence:

It Generate Observation Sequence for each word and their all utterances for every training and testing files present. Tokhura distance is used as distance metric

➤ HMM Implementation:

Given model and sequence of observation probability score is assigned that the sequence was produced from model,Next the hidden part of model is uncovered by finding state sequence and Viterbi algorithm is implemented and next the model is optimized by re estimating the parameters

Testing

➤ Offline Testing

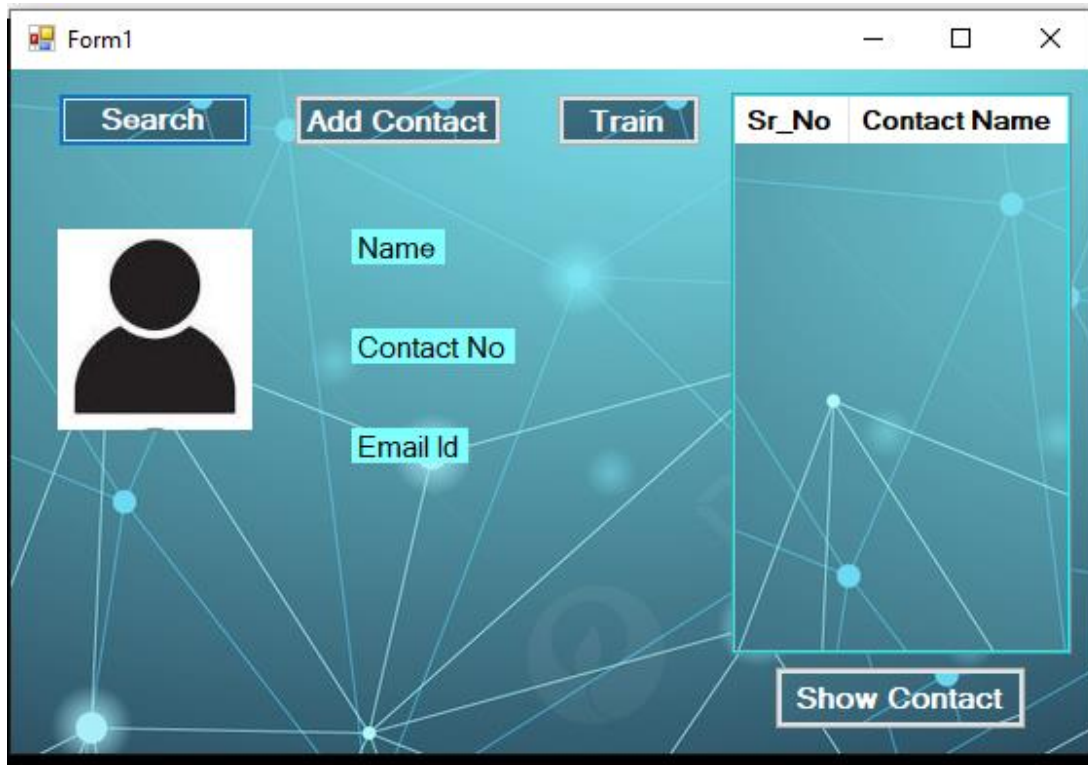
Testing is done by taking 5 utterance of each word.Offline Testing involves pre-recorded files of the words and then detecting which word is correctly identified.

➤ Live Testing:

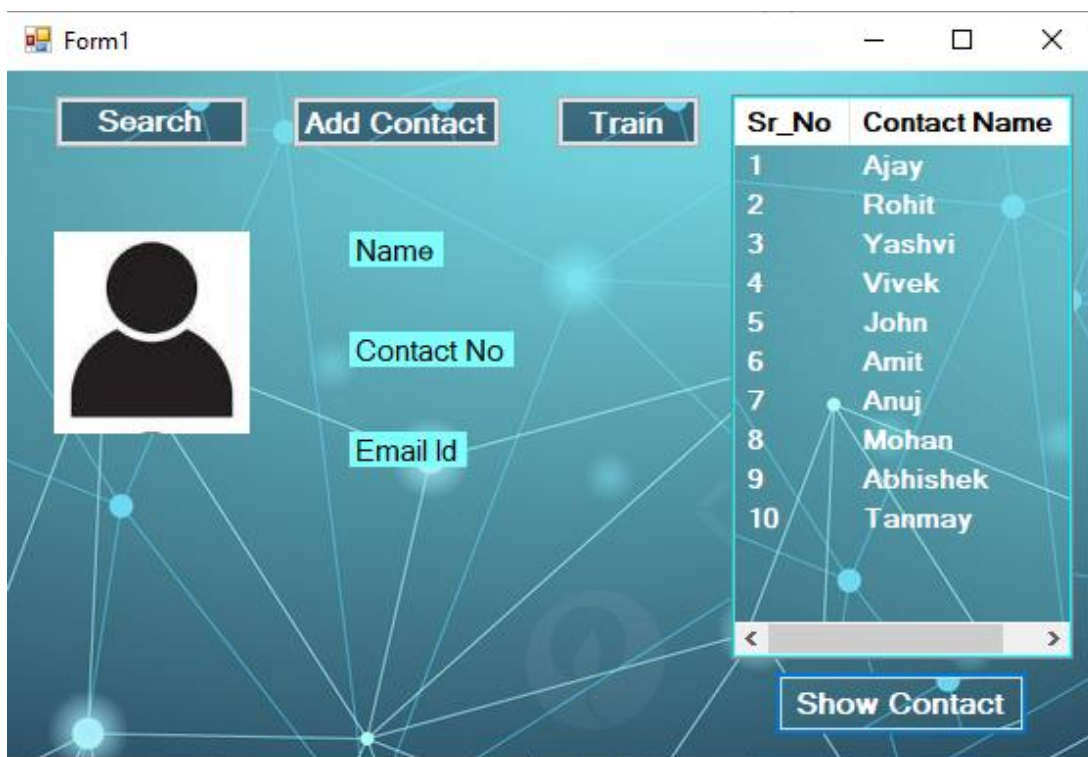
Live testing module is present in which u speak a name and it predicts the name and shows the contact detail.

4.Screenshots

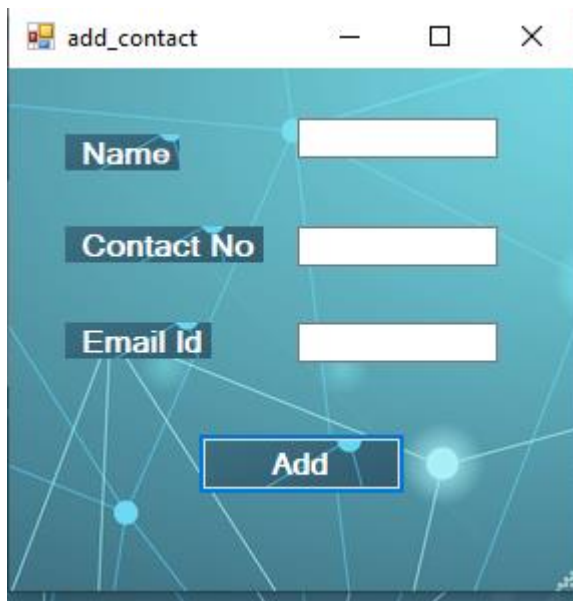
Home screen is as shown below



Show contact shows list of contacts.

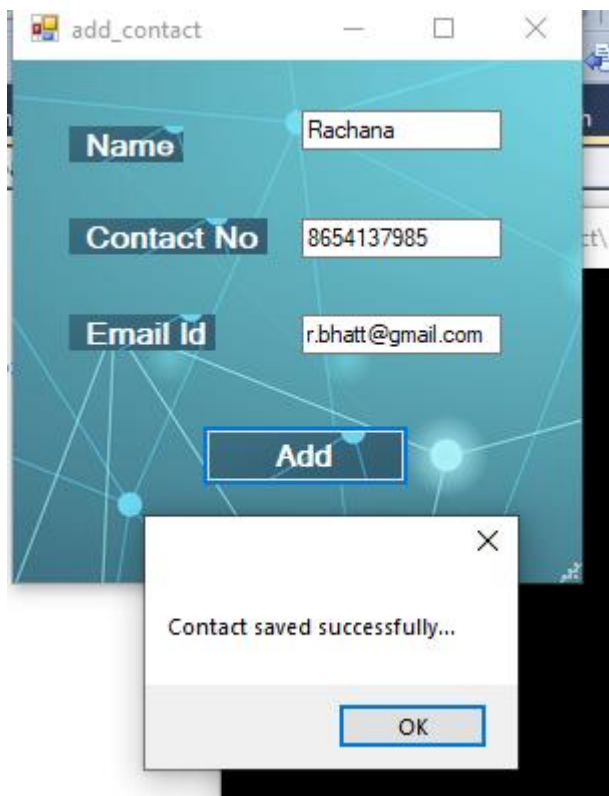


Add contact allows to add new contact.



The screenshot shows a window titled 'add_contact' with a blue background and a network diagram. It contains three input fields with labels 'Name', 'Contact No', and 'Email Id'. All fields are empty. Below the fields is a blue button labeled 'Add'.

On successful add of contact it shows dialog box



The screenshot shows the same 'add_contact' window, but now the input fields are filled with the text 'Rachana', '8654137985', and 'r.bhatt@gmail.com'. A dialog box is overlaid on top of the window, displaying the message 'Contact saved successfully...' and an 'OK' button.

Rachana named added in contact list.

| Sr_No | Contact Name |
|-------|--------------|
| 1 | Ajay |
| 2 | Rohit |
| 3 | Yashvi |
| 4 | Vivek |
| 5 | John |
| 6 | Amit |
| 7 | Anuj |
| 8 | Mohan |
| 9 | Abhishek |
| 10 | Tanmay |
| 11 | Rachana |

```
C:\Users\DELL\Desktop\search_contact\Debug\search_contact.exe
*****
Configuring the Sound Hardware:
*****
Start Recording.....
Stop Recording.
```

```
C:\Users\DELL\Desktop\search_contact\Debug\search_contact.exe
Creating Universe Vector.....
Universe Creation Successfull!

Creating Codebook.....
Codebook created!

-----MODEL TRAINING STARTED-----
training_sample/1
training_sample/2
training_sample/3
training_sample/4
training_sample/5
training_sample/6
training_sample/7
training_sample/8
training_sample/9
training_sample/10

Training phase 1 completed!

training_sample/1
training_sample/2
training_sample/3
training_sample/4
training_sample/5
```

```
C:\Users\DELL\Desktop\search_contact\Debug\search_contact.exe

training_sample/1
training_sample/2
training_sample/3
training_sample/4
training_sample/5
training_sample/6
training_sample/7
training_sample/8
training_sample/9
training_sample/10

Training phase 2 completed!

training_sample/1
training_sample/2
training_sample/3
training_sample/4
training_sample/5
training_sample/6
training_sample/7
training_sample/8
training_sample/9
training_sample/10

Training phase 3 completed!

-----MODEL TRAINED-----
```