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An Android based application to find misplaced phone (FIND IT)

Rasika Bhave[1], Ameya Sandim[2], Aditya Sawant[3], Prof. Bhanu Tekwani[4]
[1](*Information Technology, Vidyalankar Institue of Technology,India)*
[2](*Information Technology, Vidyalankar Institue of Technology, India)*
[3](*Information Technology, Vidyalankar Institue of Technology, India)*
[4](*Information Technology, Vidyalankar Institue of Technology, India*)

Abstract: *The proposed system will implement an android application which will help the users to find the phone misplaced in the vicinty. Nowadays, everyone is dependent on their mobile phones for almost everything and if the phone is misplaced for a while he/she becomes impatient. In addition to this if the phone is on silent mode, this worsens the problem. Using this application will help the user to find the phone without manually searching for it. Thus, saving time of the user. This application will work in two different modes viz.*
1. Finding the phone with Voice Recognition.
2. Finding the phone with Message.
Keywords– *android application, battery optimization, misplaced phone, pattern matching, speech recognition, speech to text, text to speech*

I. INTRODUCTION

The proposed system is an android based application to find the misplaced phone in the vicinity of the user. It helps the user to find his/her misplaced phone even if the phone is in silent mode. The application has two modes of working. They are as follows:

A) Finding the phone using Voice Recognition: This mode of application will work when the phone lies in the vicinity of the user. When the user has to use this mode to find the phone, he/she will have to speak the keyword which is registered. After the user speaks the unique keyword, the application reduces noise from the background and extracts the keyword. After extraction, the keyword is checked with the keyword stored in the application database during registration. The application uses "Text matching algorithm" for pattern matching. If the keyword matches, the phone rings (even if the phone is in silent mode).

B) Finding the phone using Message: If the user's voice is not audible or reachable to the misplaced phone then the user can use this mode of application. The user will have to send a text message containing the unique keyword to the misplaced phone. If the keyword in the received message matches the keyword stored in the database then the phone rings. The application checks if the pattern matches or not with the help of "Text matching algorithm". Thus, the user can find his/her phone even if the phone is in silent mode.

II. AIMS AND OBJECTIVES:

- Overcome the drawbacks of the existing application
- Alternative to voice recognition mode: Phone will ring even if the voice is not able to reach the microphone of the phone (using messaging system)
- **Battery optimization:** Battery usage is optimized by using CMUSphinx also known as Sphinx, a continuous-speech, speaker-independent recognition system making use of hidden Markov acoustic models (HMMs) and an n-gram statistical language model. In this application a version of Sphinx named PocketSphinx is used which is a lightweight speech recognition engine, specifically tuned for handheld and mobile devices.
- **Offline working:** The current application requires internet connection for the application to work, our application will give an offline support i.e. it will not require internet connection to work. Internet connection will be required only to save the keyword. This feature results into optimized battery utilization.
- **System use:** The application will be installed in an Android phone using Google play store.

III. LITERATURE SURVEY:

3.1. BATTERY OPTIMIZATION:

3.1.1. Xinbo Chen and Ziliang Zong in "Android App Energy Efficiency: The Impact of Language, Runtime, Compiler and Implementation" said that to increase the battery life of a phone, people concentrate on reducing network battery drain, turning off or dimming screens, dynamically adjusting CPU frequency of inactive apps,

and changing app behaviors based on different battery states. Instead they worked on analyzing and monitoring various apps and programming languages (Java, C, C++, etc.). This would lead to more battery efficiency [1].

3.1.2. David Huggins-Daines, Mohit Kumar, Arthur Chan, Alan W Black, Mosur Ravishankar and Alex I. Rudnicky in "PocketSphinx: A free, real-time, continuous speech recognition system for hand held devices" stated the facts about PocketSphinx, its working, battery and memory optimization. It is a popular open source large vocabulary continuous speech recognition (LVCSR) system [2].

3.2. NOISE REDUCTION:

Masaru Ishimura, Shoji Makino, Takeshi Yamada, Nobutaka Ono, Hiroshi Saruwatari in "Noise reduction using independent vector analysis and noise cancellation for a horse- shaped rescue robot" discussed that every electronic device has an ego voice of itself which makes it difficult to distinguish between the machine's sound and a human's sound. For distinguishing between the sounds the user can apply noise cancellation to the probable speech signal using the estimated ego noise signal as a noise reference. The experimental evaluations show that this approach is efficient for suppressing the ego noise [3].

3.3. PATTERN MATCHING:

3.3.1. Rahul B. Diwate, Prof. Satish J. Alaspurkar in "Study of Different Algorithms for Pattern Matching" mentioned that everyone deals with different types of data in daily life for example text, images, audio and Video. To find perfect results for the web search that the user makes, pattern matching algorithms are used. The mentioned paper gives analysis and comparison of pattern matching algorithms based on efficiency, complexity and techniques [4].

3.3.2. Iftikhar Hussain, Samina Kausar, Liaqat Hussain and Muhammad Asif Khan in "Improved Approach for Exact Pattern Matching" have explained Bidirectional Exact Pattern Matching. They have proved that it is more efficient algorithm compared to the existing pattern matching algorithms [5].

3.3.3. Kartik Audhkhasi, Andrew Rosenberg, Abhinav Sethy, Bhuvana Ramabhadran, Brian Kings bury in "End- to- End ARS free keyword search from speech" said that voice recognition is now promising without Automatic Speech Recognition (ARS) as they can be replaced by End-to- End Systems as they lack reliance on alignments between input acoustic and output grapheme [6].

3.4. VOICE ACQUISITION:

Oliver Thiergart, Giovanni Del Galdo, Maja Taseska and Emanuël A. P. HabetS in "Geometry-Based Spatial Sound Acquisition Using Distributed Microphone Arrays" proved that the customary techniques of spatial sound acquisition which used omni-directional or co-incidental microphones are not so efficient when compared to the Geometry-Based Spatial Sound Acquisition technique. The proposed technique uses a parametric sound field model that is formulated in the time-frequency domain. It is assumed that each time-frequency instant of a microphone signal can be decomposed into one direct and one diffuse sound component**.** [7]

3.5. VOICE RECOGNITION:

3.5.1. Sharada C. Sajjan, Vijaya C in "Comparison of DTW (dynamic time- warping) and HMM (Hidden Markov Model) for Isolated Word Recognition" stated that the voice signal tends to have different temporal rate, DTW is one of the methods that provide non-linear alignment between two voice signals and HMM models the words statistically. Experimentally it is observed that recognition is more precise for HMM when compared with DTW.

The figure 1 is a block diagram of basic isolated-word isolation in DTW systems. This technique is used for voice recognition and pattern matching used in voice detecting applications. Speech recognition systems based on acoustic pattern matching depend on a technique called dynamic time- warping (DTW) to accommodate time-scale variations. Recognition is performed by comparing the acoustic pattern of the word to be recognized with the stored patterns and choosing the word which it matches best as the recognized word.

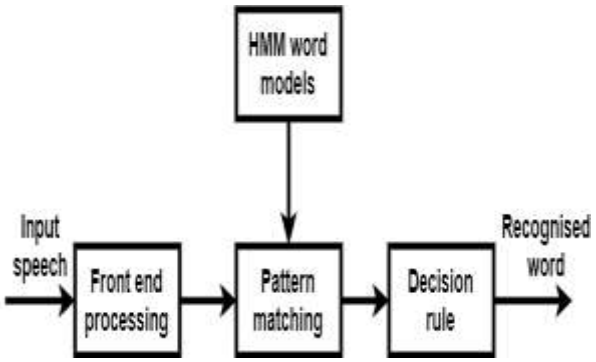

Figure 1: Block diagram of basic isolated-word isolation in DTW systems.

The figure 2 is a block diagram of HMM based isolated speech-word recognition system which explains the functioning of voice detection, recognition and pattern matching. This technique is applied in voice detecting applications. [8]

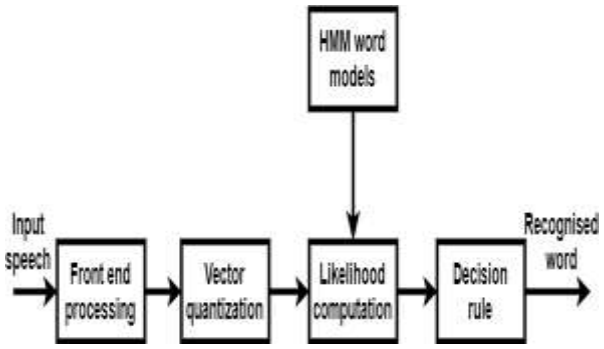

Figure 2: Block diagram of HMM based isolated speech-word recognition system

3.5.2. George E. Dahl, Dong Yu, Li Deng and Alex Acero, in "Context-Dependent Pre-Trained Deep Neural Networks for Large-Vocabulary Speech Recognition" proposed a novel context-dependent (CD) model for large-vocabulary speech recognition (LVSR) that leverages recent advances using deep belief networks for phone recognition which is a robust and often helpful way to initialize deep neural networks generatively that assist in optimization and lower down the generalization error. [9]

3.6. SPEECH ENHANCEMENT:

Tomohiro Nakatani, Shoko Araki, Takuya Yoshioka, Marc Delcroix and Masakiyo Fujimoto in "Dominance Based Integration of Spatial and Spectral Features for Speech Enhancement" have elaborated an adaptable technique for integrating two predictable speech enhancement approaches, a spatial clustering approach (SCA) and a factorial model approach (FMA). These versatile approaches are based on two different features of signals spatial and spectral features. They have proved how to integrate the two approaches to make classification of speech more reliable thus allowing us to estimate speech spectra more precisely even in highly non stationary interference environments. [10]

3.7. REMOTE ACCESS:

Prof. Jayvant H. Devare, Sonali D. Kotkar, Dipali N .Nilakh, Priyanka S. Solat, Ms. Shradha S. Wabale in "iMobile: Remote Access for Android Phones" explained how to remotely access the mobile phones that the user has accidentally left somewhere. The user can keep a check on the contacts, messages, call logs, etc with the help of this application. The user can access the information and also can keep track of his/her mobile phone. Once the user installs the application on phone, the IP address of webapp system is entered for connection to the server. The server then gives the access through the web to access the phones' data remotely via web. For encryption the developers have used AES algorithm. [11]

IV. PROPOSED SYSTEM:

4.1. OVERVIEW OF METHODOLOGY:

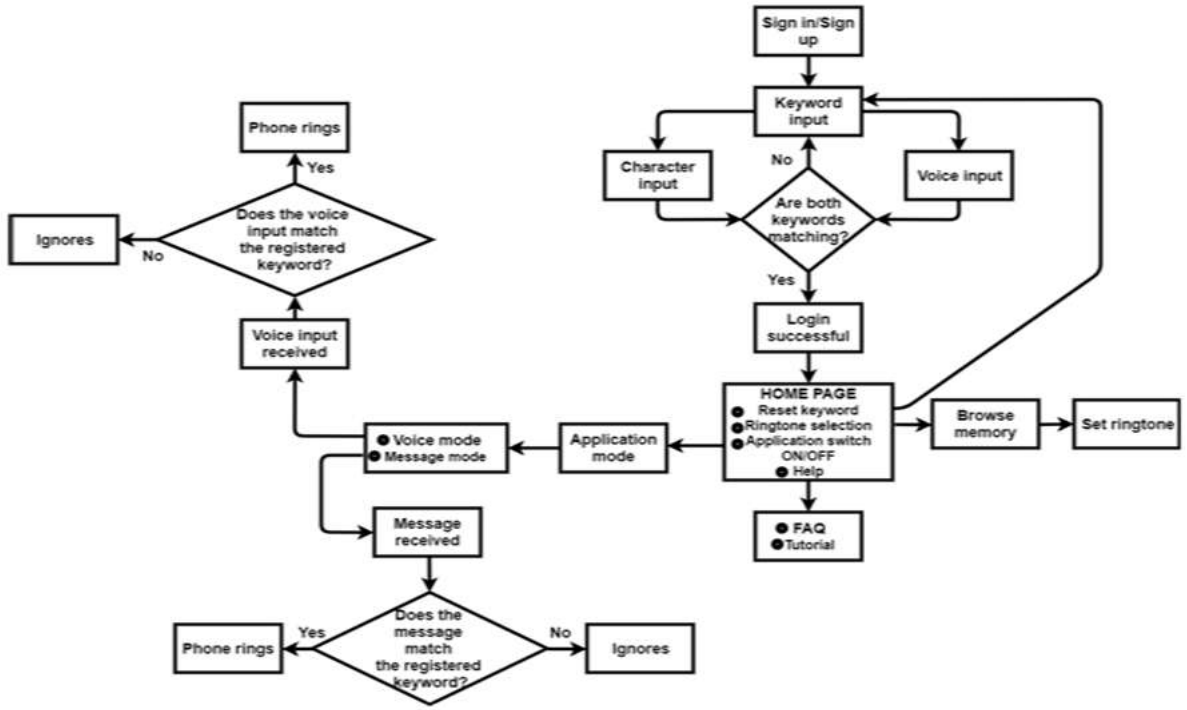

Figure 3: Block Diagram of working of proposed Application

The figure no. 3 refers to the block diagram of the proposed application. Detailed explanation of the block diagram is as follows:

STEP 1: Register: In this step, the user has to enter user details such as Unique Password (keyword). The keyword has to be entered in two ways viz.

1. Voice input
2. Text input

The application checks if both the inputs are matching with the registered keyword using pattern matching algorithm. If the keyword matches, the user is thus registered.

STEP 2: Setup/Configuration: This step includes customization of the application. The features of customization for the application are as follows:

1. Selecting desired ringtone from user's gallery
2. Selecting the mode of working of application

3. Application ON/OFF button
4. Flashlight feature for user with hearing disability
5. Vibration feature is also provided

STEP 3: Working: The user will switch ON the application for its functioning. The application works in two cases. They are explained as follows:

CASE 1: Finding the phone using Voice recognition In this case of the application is feasible if the user and the misplaced phone are in the nearby vicinity i.e. when the user speaks out the keyword the application should be able to recognize and extract the keyword from the speech. After the keyword is extracted, the application checks whether the keyword matches the registered unique keyword. If yes, the phone rings even if the phone is kept in silent mode.

CASE 2: Finding the phone using Message In this case, the user will have to send a text message from any phone number which contains the unique keyword. Since, the application of the misplaced phone is running in the background, the application performs pattern matching. If the message content matches the saved keyword, the phone rings irrespective of its profile mode.

4.2. MODULES:

Following Modules will be developed as a part of the proposed Application:

1. User registration (Login/Sign up)
2. Keyword input (voice)

3. Keyword input (text)
4. Keyword matching (text and voice)
5. Ringing of phone if the user speaks the keyword or a message containing the keyword is received by the phone which has the application running
6. Desired ringtone can be set by the user using data from user's phone memory

V. CONCLUSION/FUTURE SCOPE:

This application can help a person find his/her phone over a certain area i.e. in the vicinity. For further developments, the team can also provide GPS tracking to give us proper location of the device. The application can also provide voice recognition feature using Artificial Intelligence. The application will be user-friendly for specially abled people. It can be easily customized as per the individual user needs.
The team can also add additional features like speaking up the current time on asking for time and the application would tell the user about the number of notifications on the phone without touching the phone i.e. by just asking for the number of notifications.

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