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# Embedded Speech in Mobile Devices

Bidisha Mahanta
*Assistant Professor,Department of Computer Science, Asian Institute of Management & Technology, Guwahati,India.*

***Abstract:*** *This paper is aimed in developing an Embedded Speech in mobile devices for recognizing words which will convert to voice or it can be considered as a voice activated assistant on the phone which will gone help in speech recognition. This software allows a user to convert the text messages to voice message. Since it is speech recognition technique, user can response their received message while even they are working especially when they are driving car, working on laptop, cooking etc. instead of resuming their work they can simultaneously response their phone also. This will save a lot of precious time of people. This paper is aimed in developing an Embedded Speech in mobile devices for recognizing words which will edit and print a document by voice. We can call a voice activated assistant on the phone. This software device is a technology in today's world. This will help in speech recognition. We will make software that allows converting the text to voice message.*
***Keywords****: Speech Recognition, Cellular Emulator, Embedded Speech, Windows MDC*

## I. Introduction

Speech recognition technology has advanced substantially since those early systems were designed. We can buy dictation software for our PC from multiple vendors that will recognize thousands of words which will edit and print a document by voice. We can call a voice activated assistant on the phone for banking, travel, ordering, and many other activities. The speech recognition algorithms used in these applications are substantial beasts, consuming thousands of MIPS and hundreds of Megabyte of memory, but they perform their tasks much more competently than the train before talking cell phone applications. A new technology is phonetic embedded speech recognition. We can find it in speech activated dialling in some cell phones. Embedded speech in mobile device is a speech recognition technique. Since it is speech recognition technique so we can response to our received message while we are working such as driving car, working on laptop, cooking etc. instead of interrupting our doing work we can simultaneously response our phone also. This will save a lot of precious time of people.

## II. Methodology

Our project is aimed in developing an Embedded Speech in mobile devices for recognizing words which will edit and print a document by voice. We can call a voice activated assistant on the phone. This software device is a technology in today's world. This will help in speech recognition. We made software that allows converting the text to voice message.

## III. Literature Survey

In **[1]**Yee-Ling Lu , Man-Wai and Wan-Chi Siu explains about text-to-phoneme conversion by using recurrent neural networks trained with the real time recurrent learning (RTRL) algorithm. As recurrent neural networks deal well with spatial temporal problems, they are proposed to tackle the problem of converting *A Novel Model for Speech to Text Conversion* English text streams into their corresponding phonetic transcriptions.They We found that, due to the high computational complexity, the original RTRL algorithm takes a long time to finish the learning and proposed a fast RTRL algorithm (FRTRL), with a lower computational complexity which helps in fast learning.

In **[2]**Decadt, Jacques,Daelemans, Walter and Wambacq describes a method to enhance the readability of the textual output in a large vocabulary continuous speech recognition system when out-of-vocabulary words occur. The basic idea is to replace uncertain words in the transcriptions with a phoneme recognition result that is post-processed using a phoneme-to-grapheme converter. This technique uses machine learning concepts.

In **[3]**Penagarikano, M.; Bordel, G explains a technique to perform the speech to text conversion conversion as well as an experimental test carried out over a task oriented Spanish corpus are reported. They have concluded that the whole speech-to-text system neatly outperforms the word-constrained baseline system.

Martinez, M.; Quilis, A.; Bernstein, J have done a research aiming to develop a text-to-speech converter (TSC) for Spanish, that accepts a continuous source of alphanumeric characters (up to 250 words per minute) and produces good quality, natural Spanish output, is described. Four sets of problems are considered in this work: the hard-ware structure adopted for real time operation; the complex control software needed to handle the

orthographic input and linguistic programs; the linguistic processing rules, and the parameterization of the Spanish language matched to a TSC. Emphasis is made on the problems of adapting a general hardware structure to a specific language **[4].**

In **[5]**Sultana, S.; Akhand, M. A H; Das, P.K.; Hafizur Rahman, M.M. investigate Speech-to-Text (STT) conversion using SAPI for Bangla language .They says that experimental study was carried out for the technique on an article from a news paper and the recognition rate was approximately 78% on an average.Although achieved performance is promising for STT related studies, they identified several elements to improve the performance and might give better accuracy and assures that the theme of this study will also be helpful for other languages for Speech-to-Text conversion and similar tasks.

Moulines, E., in his paper "Text-to-speech algorithms based on FFT synthesis," present FFT synthesis algorithms for a French text-to-speech system based on diphone concatenation. FFT synthesis techniques are capable of producing high quality prosodic modifications of natural speech. Several approaches are presented to reduce the distortions due to phone concatenation **[6].**

## IV. Functionality

These are specification of requirements the users expects from the system. Functional requirements define what a system is supposed to do. Functional requirements are usually in the form of system shall (do requirement). The system performs the following functions for the users: System will read out the message with the help of TTS. We can save the receiving message in a table. It helps in saving lot of time.

**System Requirement**

**4.1 Microsoft Windows Professional SDK**

Microsoft Windows SDK, Platform SDK, and .NET Framework SDK are software development kits from Microsoft that contain header files , libraries, samples, documentation and tools required to develop applications for Microsoft Windows and .NET Framework. .NET Framework SDK is dedicated to developing applications for .NET Framework 1.1 and .NET Framework 2.0. Windows SDK is the successor of the two and supports developing applications for Windows XP, Windows Vista, Windows 7, Windows Server 2008, .NET Framework 3.0, .NET Framework 3.5, and .NET Framework 4.0 We have used .NET Framework 3.5

**4.2 Windows Mobile Device Centre**

Windows Mobile Device Centre is a synchronization software program developed by Microsoft, and the successor to Active-sync. It is designed to synchronize various content including music, video, contacts, calendar events, web browser favourites, and other files between Windows Mobile devices and the Microsoft Windows operating system. It acts like Nokia pc suite for connecting the mobile with pc. Whenever a Windows Mobile device is connected, the Mobile Device Centre pane pops up giving options to manage media and other files on the device, as well as control their settings .

**4.3 Cellular Emulator**

Cellular emulator is a desktop application (Windows, Mac, Linux) which simulates the phone hardware and operating system on the PC. This enables the development of phone software to be substantially desktop-based, with only the final development stages focussed on the hardware. Use of the emulator saves time in the early stages of development, since you can use the development IDE to debug the code easily and resolve most initial bugs and design problems.

## V. System Analysis

Embedded speech in mobile device is a speech recognition technique. Since it is speech recognition technique so we can response to our received message while we are working such as driving car, working on laptop, cooking etc. instead of interrupting our doing work we can simultaneously response our phone also. This will save a lot of precious time of people.

**5.1 Preliminary Investigation**

We investigated various functionalities of speech recognition such as converting text to speech, and speech to text, but till now we have done the text to speech conversion. First we have tried with sample programs for text to speech conversion in visual basic. Then we learnt the sending of message through the cellular emulator. Here we have used the smart device in Visual Basic. Other software that we have used are windows mobile professional SDK ,windows mobile device centre/active sync. In case if we are using Windows XP as our operating system we have to do our work with active sync but if we are using Windows 7 as our operating system we have to use windows mobile device centre's we have Windows 7 as our operating system so we have used windows mobile device centre. Last but not the least we have used TTS reader for reading out the message which

will be received by the cellular emulator.

## VI. Surveys of Technologies

As we know that now-a-days we have this application in our Nokia mobile based on the operating system Symbion. We are doing this project so that we can implement on the windows mobile such as HTC mobile. In Nokia mobile, Java based application is used which do not support in windows mobile so we have used visual basic from which we can write the mobile coding for windows mobile. We have the Microsoft Visual studio as our main platform. Since we are trying to develop this application in compatible windows operating based mobile Microsoft Visual Studio has the capability to develop text to speech application.

## VII. Feasibility study

Technical Feasibility: In project planning developers should meet the required technical needs for the development. Operational Feasibility: For the development 'Embedded Speech In Mobile Device' it has been tested and found that the system to be developed will be providing the desired out-comes to the end users at the ease of a fingertip and from a wide field of choice. Operational Feasibility: This involves questions such as how much time is available to build the new system when to build, dependencies, type and amount of resources required.

## VIII. Analysis of the Design

There are many aspects to consider in the design of a piece of software. The importance of each should reflect the goals the software is trying to achieve. Some of these aspects are:

Compatibility -The software is able to operate with other products that are designed for interoperability with another product. For example, a piece of soft-ware may be backward-compatible with an older version of itself.

Extensibility -New capabilities can be added to the software without major changes to the underlying architecture.

Fault-tolerance -The software is resistant to and able to recover from component failure.

Maintainability -The software can be restored to a species condition within a specified period of time.

Modularity -the resulting software comprises well defined, independent components. That leads to better maintainability. The components could be then implemented and tested in isolation before being integrated to form a desired software system. This allows division of work in a software development project.

Reliability -The software is able to perform a required function under stated conditions for a specified period of time.

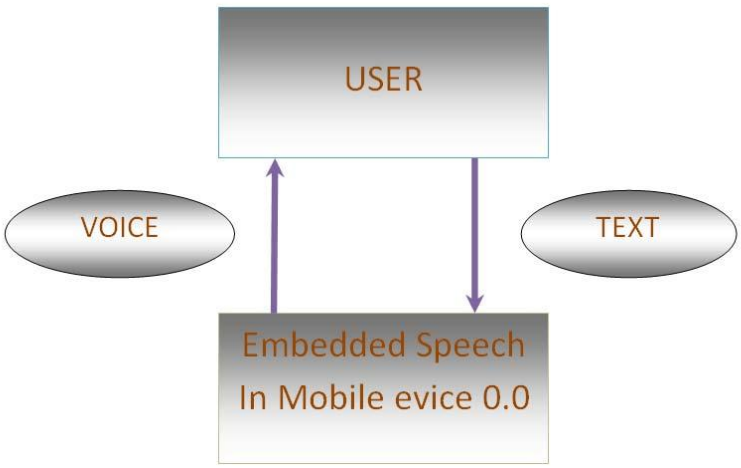


**Figure 1:** context diagram of system

## IX. Analysis of Test

1. First we send message from emulator to system.

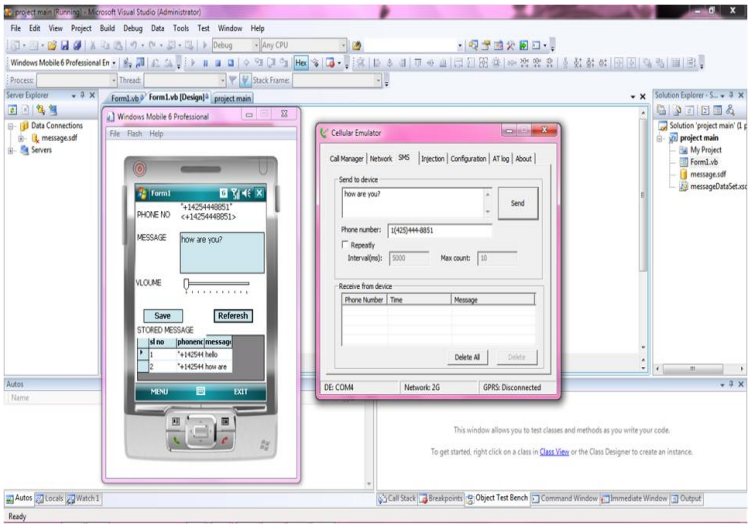

**Figure 2**. Message send from emulator to system

2. Then we have used message interceptor to receive the message and stored the message in a database.

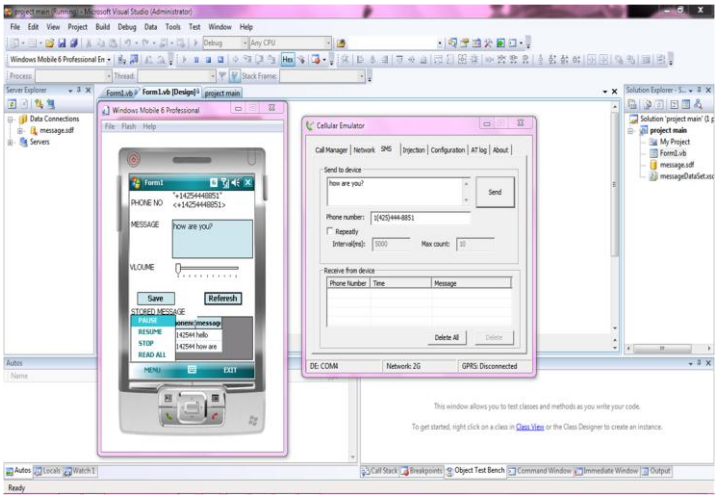

**Figure. 3.** Message and stored the message in a database

3. Thirdly TTS will read out the message from the database.


**Figure 4.** Message interceptor to receive the message

## X. Conclusion

As we have said earlier that our aim is to develop an Embedded Speech in Mobile Devices for recognizing words which will edit and print a document by voice.We know that already it is present in the Nokia mobile but we have made this so that we can on the windows mobile. We have been successful in making this application for implementing it in a windows mobile.

## XI. Future Work

Now-a-days we have the text- to- speech application in our mobiles i.e. this allows to convert the text to a voice message but soon there will be speech to text application in mobile devices i.e. it will allow the voice message to be written in text. Researchers are going on for speech to text application. Text-to-speech is a time saving application. Speech to text will be even more time saving because in text to speech we can only receive the message by the voice message, but in speech- to- text we can answer the message through our voice.

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