

Fifth Sense: An Audio-Info Generator

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Abstract: - Our goal is to provide the computer with a natural interface, including the ability to understand human speech for making it easier to use for the visually-impaired people. For this purpose, we propose a way to operate it and harness the power of the Internet with voice commands. It is an intelligent system which enables the user to instruct computer to perform actions through voice commands and also form repository of commands and map them to appropriate actions. At first, the user initiates a command by his voice through the microphone, and then the recognition software of the proposed system will take over to recognize the command. If the recognition is succeeded or matched with one of the given voice command then it will perform the operation according to speaker's command. The operations include downloading, parsing and reading RSS Feeds, downloading and reading user's emails, reading out text files on user's system and updating the user with latest news like live cricket scores, weather forecasts etc. In our proposed system we have used Microsoft's API called Speech Application Programming Interface for text to speech & speech to text conversion and various Java APIs for the underlying operation.

Keywords:

INTRODUCTION

Human beings are blessed with five bodily faculties that are responsible for sensation. Those five senses are touching, smelling, hearing, tasting and seeing. A large number of people lack the power of sight totally or partially. They are visually impaired who might find performing daily chores rather onerous. Education is one area where they may face difficulty. It is cumbersome for them to carry their books everywhere. Moreover, computer is a must-have in the current scenario. The usage of the Internet has also increased tremendously since the content on the World Wide Web is immediately available to a global audience of users. Social networking, emailing have become new ways of staying in touch with people for personal & professional purposes for information sharing. Edutainment is achieved by using various kinds of websites on the World Wide Web. But how can the blind use Internet? Our project gives an answer to this very question. It will retrieve data from the Internet at real time & also read it out to them by converting the textual data into audible form. With a little bit of assistance, blind people will also be able to utilize the power of the computer (read Internet) to the fullest. Which is why we have incorporated modules in our project that will help them read news on the Internet, know live cricket scores, download and read their emails and so on.

MOTIVATION

As is evident from the project idea, the hardships faced by the blind people are the major motivation behind the project. We cannot compensate for their lack of sight, but we can surely maximize the use of their hearing power thus making their life simpler. We want to make computers not just user-friendly for the blind but it should also act as a tool that keeps them well-informed by giving them the best of the Internet. This project has given us an opportunity to return something to the society we live in.

LITERATURE SURVEY

We did some survey to find out which systems are already present that aid the blind people to use computers. Almost every operating system has embedded software that can help the disabled people to use computers. For example, Microsoft Windows XP has tools like Magnifier that magnifies the text and Narrator that reads the text out loud. There are no tools that can read out the Web content for visually impaired people. There are systems that control the operating systems

with voice commands. They recognize user's voice, synthesize it and map it to the desired action. A microphone and a headphone are the simple devices incorporating the hardware of the system. Our project is an extension of the existing system that can also read out the Web content like user's emails and RSS Feeds to the blind user that will help him stay abreast of the ongoing events in the world.

WORKING

User: At first user is giving command.

Microphone: In this step the command is received by microphone and the microphone converts sound wave into electrical pulse.

Sound Card: In this step the sound card converts electrical pulse into digital signal.

Speech Recognition Engine: In this step, Speech Recognition Engine converts digital signals into phonemes.

Command: Finally we get text command.

Operations: For every command the software performs the corresponding operations.

Command	Operation
Open RSS Feed Reader	Opens RSS Feed Reader
Open "URL"	Opens the required RSS Feed site
Read "index no. of RSS Feed"	Reads the title and description
Open AutoEmail Downloader	Opens AutoEmail Downloader
Check mails	Reads titles of mails one by one
Open "Next/Previous"	Open the required mail
Delete	Delete current mail
Star	Stars current mail



Fig 1: General Block Diagram of the System

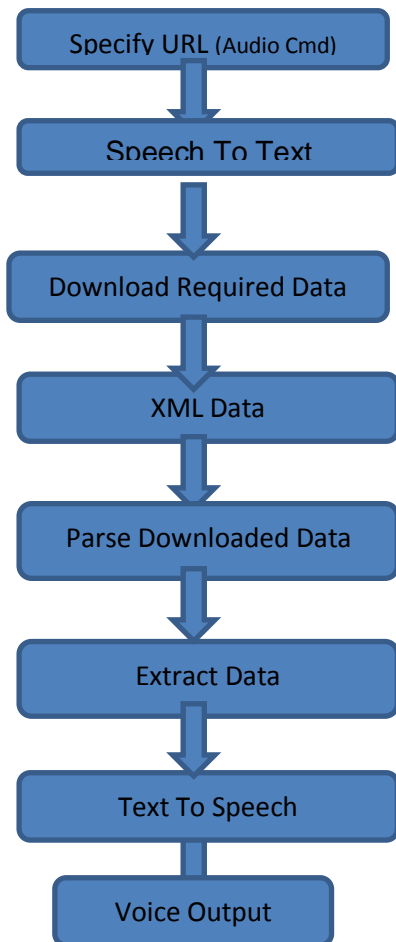
This system is implemented in two modules – RSS Feed Reader and Auto Email Downloader.

A. RSS Feed Reader

Here, the user gives a simple voice command for reading the RSS Feed and then the operation will be performed by the system i.e. the downloaded RSS Feed will be read out to the users. As the audio data is not understandable to the system, it will be synthesized and converted to textual data i.e. Speech to Text conversion. Once this is done, the system will come to know the desired action in this case being download and read RSS Feed. The RSS Feed is in the XML format so it will be parsed. And then the parsed text will be converted to audio format i.e. Text to Speech Conversion.

Steps involved:

1. User will specify the URL through voice command.
2. Our system will :
 - a) Access its web page.
 - b) Download XML script from the RSS Feed on the web page.
 - c) Parse the XML script
 - d) Read it out to the user.



B. Auto Email Downloader

Here, the user issues the voice command to download mails. The voice command will be first converted to text i.e. through Speech to Text conversion. The obtained textual command is recognized by the system by which the emails will be downloaded. The downloaded mail will be read out as per the requirement of the user i.e. Text to Speech conversion.

Steps involved:

1. Initial one-time authentication in which the user will specify his credentials like username and password.
2. User will give a voice command to read email.
3. The system will:
 - A) Access server
 - B) Download inbox.
 - C) Read out the new mail

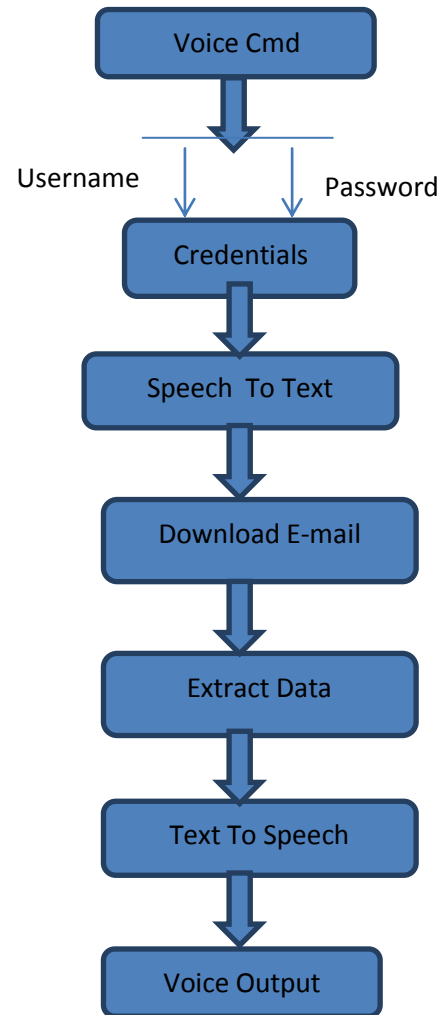


Fig 3: Block Diagram of AutoEmail Downloader

WORKING WITH EXAMPLES

The following screen opens after giving the voice command: Open RSS Feed Reader.

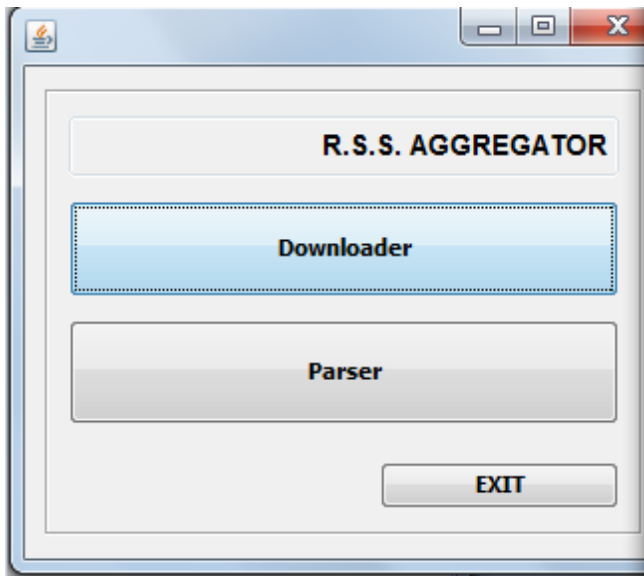


Fig 4: Snapshot of RSS Feed Reader

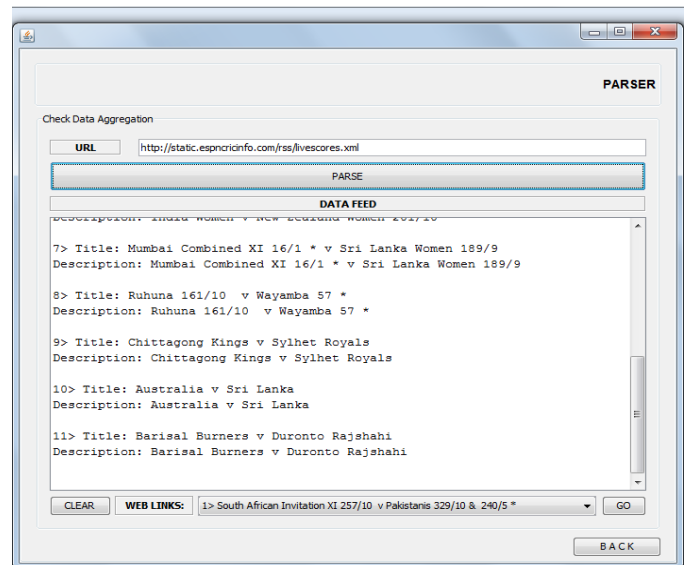


Fig 6: Snapshot of RSS Feed Parser

If the user wants to download RSS Feeds from an RSS Feed Reader site then he says “Open” and specifies the URL. The RSS Feed will be downloaded and displayed as it is on the screen.

The screen that opens after issuing the command “Open AutoEmail Downloader” looks like this:

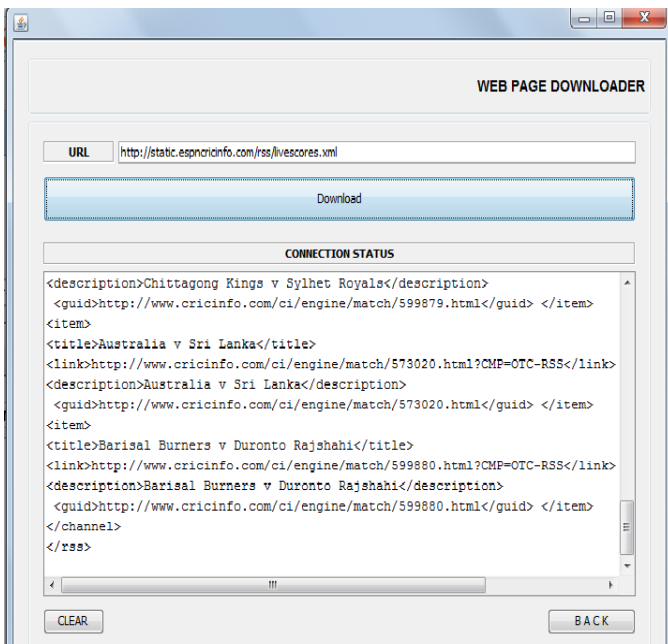


Fig 5: Snapshot of RSS Feed Downloader

After downloading, it will be parsed i.e. the HTML tags will be removed and only the content required by the user will be displayed. The title will be read out and he can hear the description based on commands “Open”, “Next” and “Previous”.

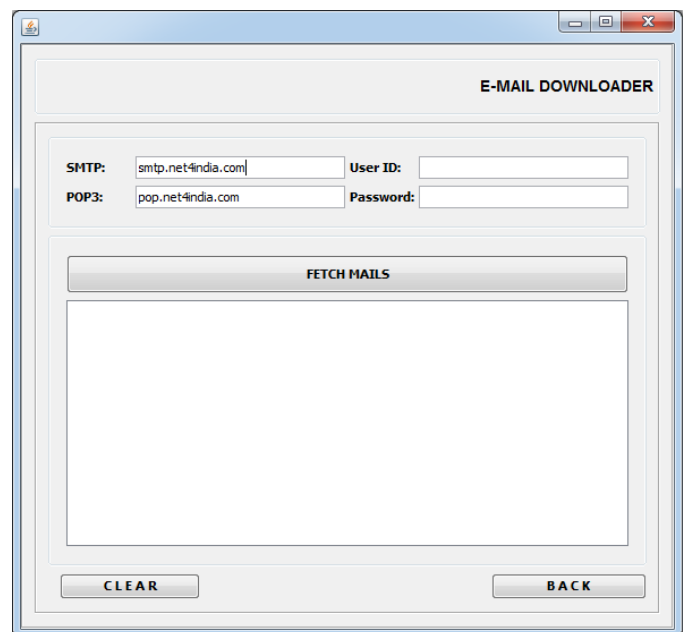


Fig 7: Snapshot of AutoEmail Downloader

After specifying the source and destination fields and the user credentials like username and password, the mails will be fetched.

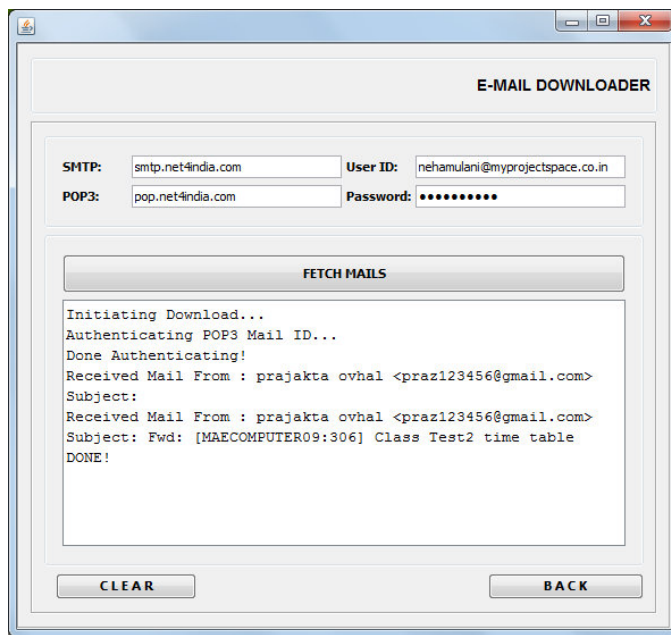


Fig 8: Snapshot of AutoEmail Downloader after fetching the inbox

TECHNOLOGY AND FEATURES

We have developed our software in Java. For voice control purpose we have used Microsoft Speech SDK (Speech Development Kit) SAPI. We have also used the internal Speech Engine for Recognition purpose and XML [2] grammar formation for creating grammar file. There are some features of this software:

1. It is Speech Application Programming Interface (SAPI) implemented software.
2. This software is designed to control Web surfing and downloading according to the command of a person's voice.
3. By using this software a number of operations are executed.
4. It can be used as Voice Controlled System software.
5. It is user-friendly.

FUTURE SCOPE

Considering the basic idea and the various technologies available, we think that much more modules can be implemented. Some of the developments that we intend to do in the near future are given below:

1. To develop a module that reads the contents of files stored on user's system.
2. To develop a module that gives continuously updated information like cricket scores to the user.
3. To expand the dictionary of voice commands.

CONCLUSION

Fifth Sense: An Audio-Info-Generator is directed towards the requirements of those people who are visually-impaired. The interface of the project is user friendly. This software is applicable for Windows XP operating system. As maximum computer users feel comfortable to use this operating system, our project may satisfy their need to access operating system through their voice command which will save time and make life easier. Such a system will satisfy user such that, they will be able to perform tasks of daily life without depending on others. They can get connected to the whole world through

our project, firstly by getting updated news constantly and secondly by using email services. Fifth Sense: An Audio-Info-Generator heralded a new era of convenience and affordability in assistive technology for visually-impaired people. It is going to be a **BOON** for the BLIND PEOPLE.

REFERENCES

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