A PROJECT REPORT ON

ASSISTIVE SYSTEM FOR VISUALLY IMPAIRED PEOPLE

SUBMITTED TO THE SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE

IN THE PARTIAL FULFILLMENT FOR THE AWARD OF THE DEGREE OF

BACHELOR OF ENGINEERING

IN

INFORMATION TECHNOLOGY

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UNDER THE GUIDANCE OF

PROF. .....

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CERTIFICATE

This is to certify that the project report entitled

ASSISTIVE SYSTEM FOR VISUALLY IMPAIRED PEOPLE

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Is a bonafide work carried out by them under the supervision of Prof..... and it is approved for the partial fulfillment of the requirement of Savitribai Phule Pune University, for the award of the Degree of Bachelor of Engineering (Information Technology).

The project work has not been earlier submitted to any other institute or university for the award of degree or diploma.

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Finally we want to thank to all our friends for their support & suggestions. Last but not the least we want to express thanks to our family for giving us support and confidence at each and every stage of this project.

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Mr./Ms. .....
Mr./Ms. .....
Mr./Ms. .....

Abstract

The spread of visual impairment is a very sensitive issue worldwide. Blind people have to play in the everyday actions of different difficulties. These include the difficulty of moving in complete autonomy and the ability to seek and recognize objects. Until a decade ago, the only aid that a blind person has used are sticks, guide dogs accompanying persons or to move, while the technique of reading Braille is used for collecting information about objects. In this system to develop this system is to help blind people by reading out all type of text documents. The proposed application uses the inbuilt camera of the system for capturing the text data from image. The captured image is initially processed using text localization algorithms to separate the text from the background. Then text extraction methods are used to extract the text from image or document. The extracted text is then converted into a voice output is given to the user.We are going to invent system which will assists blind peoples to read text documents without any persons help.

Keywords: Convolutional Neural Network, Optical character recognition, Google Text To Speech, Open Compute Vision.

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Nomenclature

CNN: Convolutional Neural Network

OCR : Optical character recognition.

GTTS: Google Text To Speech

Open-CV: Open Compute Vision

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Chapter 1

Introduction

1.1 Overview

This is the most important and essential work for the visually challenged user to identify and choose the right documents he has to take. The proposed application uses the inbuilt camera of the our system for capturing the text data from image. The captured image is initially processed using text localization algorithms to separate the text from the background. Then text extraction methods are used to extract the text from image or document. The extracted text is then converted into a voice output is given to the user.

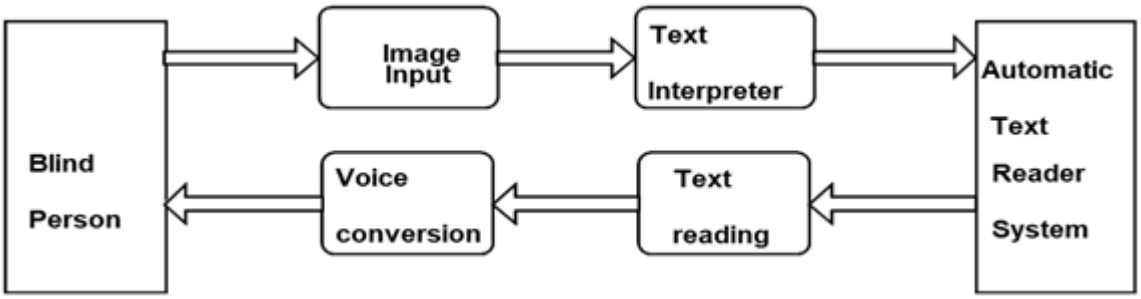


Figure 1.1.1: **System Flow**

1.2 Motivation

The visually challenged people are curbed by their disability. It is difficult for them to read text documents such as news papers, boards on street. They will have to seek others help for it. So we need to develop a system which acts like interpreter for them to read automatically text data and convert it into voice.

1.3 Objectives

Aim of our project is to develop this system to help blind people by reading out all type of text documents. We are going to invent system which will assist blind people to read text documents without any persons help.

Text reading from images using OCR (Optical character recognition) .
To Convert text contain to voice using gtts.
Blind people to read text documents without any persons help.
To develop this system for reading confidential documents.
To develop this system currency identification for Indian currency.

Chapter 2

Literature Survey

1) "OCR Based Image Text To Speech Conversion Using MATLAB "
There are millions of blind people in the world who are visually impaired. Disability to read has a large impact on the life of visually impaired people. The Proposed system is cost-efficient and helps the visually impaired person to hear the text. The main idea of this project is optical Character recognition which is used to convert text character into the audio signal. The text is preprocessed and then used for recognition by segmenting each character.

2) "An Extensive Study on Currency Recognition System Using Image Processing "
Proposed about the authentication of different currency notes with basic image processing techniques. The image is converted from RGB to Grayscale for easy preprocessing of the acquired image. The edges are detected using Sobel operator and edge-based segmentation is applied to the image. Features are extracted using ORB feature detector. Extracted features include security thread, intaglio printing, micro-lettering etc. It may face many challenges such as old notes, worn out notes, image quality etc. the features are compared with the features of original currency which is templated in the dataset. Template matching is performed to obtain the output.

3)"Voice Based Application as Medicine Spotter For Visually Impaired"
Proposed an application in order to expedite easy and innate way to find the medicine for the visually impaired people and to take it according to their Doctors prescription. Visually impaired people need not be dependent and seek others help to find the medicine to be taken. This android application is used to overcome the difficulties they face in this scenario. In this application, a reminder is set which tells the user when to take the medicines, as voice output.

4) Portable Camera-Based Assistive Text and Product Label Reading From Hand-Held Objects for Blind Persons

Proposed text detection in indoor/outdoor scene images- proposes a novel methodology for text detection in indoor/outdoor scene images. It is based on an efficient binarization and enhancement technique followed by a suitable connected component analysis procedure. Connected component analysis is used to define the final binary images that mainly consist of text regions. It invented a portable camera-based assistive text reading framework to help blind persons to read text labels and product packaging from hand-held objects in their daily lives.

5) "Voice Assisted Text Reading system for Visually Impaired Persons Using TTS Method"

Proposed that a camera-based assistive system is for visually impaired or blind persons to read text from signage and objects that are held in the hand. The system is able to read text from complex backgrounds and then communicate this information aurally. To localize text regions in images with complex backgrounds, we design a novel text localization algorithm by learning gradient features of stroke orientations and distributions of edge pixels in an Ad boost model. Text characters in the localized regions are recognized by off-the-shelf optical character recognition (OCR) software and transformed into speech outputs.

6) Indian Currency Note Denomination Recognition and Validation

Introducing Counterfeit notes are one of the biggest problem occurring in cash transactions. For a country like India, it is becoming a big hurdle. Over the past few years, as results of the great technological advances in color printing, duplicating and scanning, counterfeiting problem has become more and more serious. At present the Currency denomination recognition is becoming a dynamic topic for researchers in different potential applications. It is very difficult to count different denomination notes in a bunch. This paper proposes an image processing technique to identify paper currency denomination and fake note recognition. It also includes designing a system that helps in identification of Indian currency notes to check whether it is a valid or invalid according to the RBI rules and regulations.

Chapter 3

Problem Statement

3.1 Overview

Visually challenged people faces a lot of adverse challenges in their day to day life. Most of the time they are perplexed in a new environment or surrounding due to issues related to accessibility.
So, this prevents them from experiencing the world in the same way as others do.
So there is need of providing interpreter that helps to do many things efficiently.
The proposed problem statement is **ASSISTIVE SYSTEM FOR VISUALLY INSPIRED PEOPLE**.

Chapter 4

Project Requirement Specification

4.1 Overview

The purpose of this system to represent a assistive tool which will acts as an helper for blind people. The spread of visual impairment is a very sensitive issue worldwide. Blind people have to play in the everyday actions of different difficulty. These include the difficulty of moving in complete autonomy and the ability to seek and recognize objects. Until a decade ago, the only aid that a blind person has used are sticks, guide dogs accompanying persons or to move, while the technique of reading Braille is used for collecting information about objects. In this system to develop this system is to help blind peoples by reading out all type of text documents. The proposed application uses the inbuilt camera of the system for capturing the text data from image. The extracted text is then converted into a voice output is given to the user. We are going to invent system which will assists blind people to read text documents without any persons help.

4.2 Assumptions and Dependencies

Assumptions:-

This is the most important and essential work for the visually challenged user to identify and choose the right documents he has to take.The proposed application uses the inbuilt camera of the system for capturing the text data from image.The captured image is initially processed using text localization algorithms to separate the text from the background. Then text extraction methods are used to extract the text from image or document.The extracted text is then converted into a voice output is given to the

user.

Dependencies:-
We have to image text data set for pre-processing and achieving more accuracy in text generation and voice conversion outputs.

4.3 Functional Requirement

System should fully capable of getting users personal details like name , address, mobile number , date of birth, email address in the form of user logs.
Only authenticate users can access our system.
Users can monitor blind assistive system related data with the help machine learning algorithms.

4.4 External Interface Requirements

4.4.1 User Interfaces

GTTS (Google Text-to-Speech) It is a Python library and CLI tool to interface with Google Translates text-to-speech API. Writes spoken mp3 data to a file, a file-like object (byte string) for further audio manipulation, or studio. There are several APIs available to convert text to speech in python. One of such APIs is the Google Text to Speech API commonly known as the gTTS API. gTTS is a very easy to use tool which converts the text entered, into audio which can be saved as a mp3 file. The gTTS API supports several languages including English, Hindi, Tamil, French, German and many more. The speech can be delivered in any one of the two available audio speeds, fast or slow. However, as of the latest update, it is not possible to change the voice of the generated audio.

4.4.2 Hardware Interfaces

Processor - I3
Speed - 1.1 GHz

RAM - 2 GB(min)
Hard Disk - 20 GB
Floppy Drive - 1.44 MB
Camera - System camera
Key Board - Standard Windows Keyboard
Mouse - Two or Three Button Mouse
Monitor - SVGA

4.4.3 Software Interfaces

Operating System - Windows
Front End - Python3x
Database -SQLite3
IDE - Py-Charm

4.4.4 Communications Interfaces

1] Blind Assistive System
2] User text image data set
3] Pre-processing unit
4] Feature vector generation using CNN
5] Classified results in the form of voice and text
6] PC Camera for capturing images
7] GTTS for converting text to speech
8] Open-CV for image processing

System Features

User Module:-

In this system user login to the system, after login user gets authentication permission to access or view system. After that user collect image samples of text data. The whole system works in four steps for text recognition such as image acquisition, pre-processing, text generation and voice conversion.

4.5 Other Non-functional Requirements

4.5.1 Performance Requirements

Performance

Performance of our system fast as compare to other systems and response time is quick.

Availability

Availability of data is also required for performing any operations.

Maintainability

In this system we can maintain data of users images.

Security

In this system user information is store in the form of images, so our system is secure.

Usability

This system is very useful in blind assistive tool as well as those blind peoples should use of it for their assistance.

4.5.2 Safety Requirements

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system was accomplished within the budget and this was achieved because most of the technologies used are freely available.

4.5.3 Security Requirements

The main thing in our system is, we have to provide end to end security for user and provider signs by using proper authentication login credentials. User has been given rights to upload images and only view the results .The system is fully secure as well as eco- friendly. We implemented this system by considering security aspects so we divide our system into four different modules for achieving integrity.

4.5.4 Software Quality Attributes

To be used software in this system is well quality as well as accurate software so performance of system increases with high accuracy.

4.5.5 Business Rules

We are going to invent system which will assists blind people to read text documents without any persons help. Our work is based on machine learning techniques for text reading using OCR tool with better performance and with advantages of voice generation. We are going to develop following modules:
1. Text reading from images
2. Reading books page by page
3. Reading confidential documents
4. Currency identification for Indian currency
5. Main motive behind this system is to help blind people by reading out all type of text documents.

4.6 Other Requirements

1]Open-CV

Monty Pythons Flying Circus had a cat detector van so, in this tutorial, we use Python and Open-CV to make our very own cat detector and recognizer. We also cover examples of human face detection and recognition. More generally, we cover a methodology that applies to training a detector (based on Haar cascades) for any class of object and a recognizer (based on LBPH, Fisher-faces, or Eigen-faces) for any unique objects. We build a small GUI app that enables an LBPH-based recognizer to learn new objects interactively in real time. Although this tutorial uses Python, the project could be ported to Android and IOS using Open-CVs Java and C++ bindings. Attendees will gain experience in using Open-CV to detect and recognize visual subjects, especially human and animal faces. GUI development will also be emphasized. Attendees will be guided toward additional information in books and online. There is no formal evaluation of attendees work but attendees are invited to demonstrate their work and discuss the results they have achieved during the session by using different detectors and recognizers and different parameters.

2] GTTS (Google Text to Speech):-

It is a Python library and CLI tool to interface with Google Translates text-to-speech API. Writes spoken mp3 data to a file, a file-like object (byte string) for further audio manipulation, or studio.

There are several APIs available to convert text to speech in python. One of such APIs is the Google Text to Speech API commonly known as the GTTS API. GTTS is a very easy to use tool which converts the text entered, into audio which can be saved as a mp3 file. The GTTS API supports several languages including English, Hindi, Tamil, French, German and many more. The speech can be delivered in any one of the two available audio speeds, fast or slow. However, as of the latest update, it is not possible to change the voice of the generated audio.

4.7 Waterfall Model

The waterfall model is a sequential model that is used in the software development processes, where the process is seen flowing steadily downwards through the phase of Requirement Gathering and Analysis, Design, Implementation, Testing, Deployment and Maintenance.

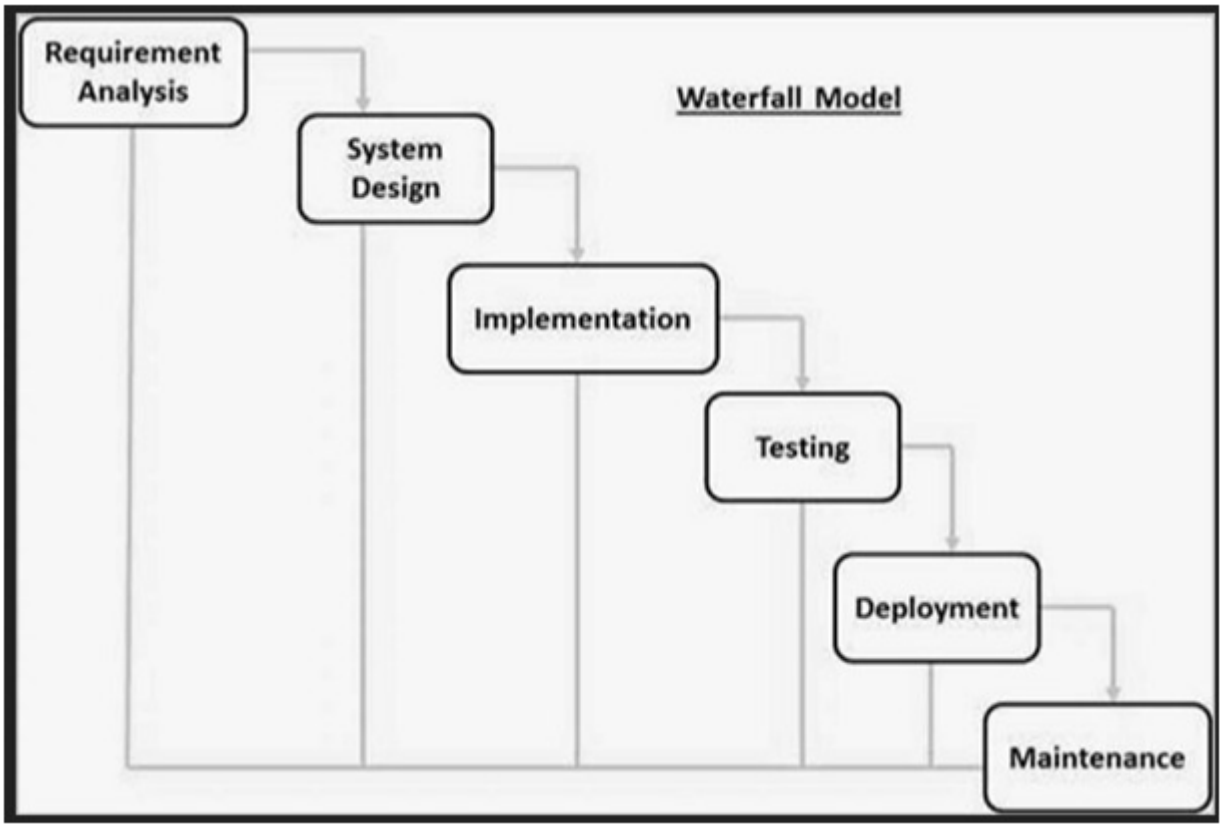


Figure 4.7.1: **System Flow**

1. Requirement Gathering and analysis:

Here requirements are gathered means which kind of dataset is required. Then what

are functional requirement of system. Document is prepared, and then use cases are designed. In our system we gather all information of object recognition and machine learning methods.

2. System Design:

In this stage, hardware and software requirement to design the system is decided. It uses above mentioned hardware and software requirements. We design themodule according to functionality of each module.

3. Implementation:

In this stage, system is developed module wise.In this system consist of mainly 3 modules that is

A.Image Processing(Python Libraries and methods)

Read and Write Images. Detection of images and its features. Detection of shapes like Circle, rectangle etc in a image, Detection of coin in images. Text recognition in images. e.g. Reading Number Plates. Modifying image quality and colours.

B.Text Processing(OCR tool)Optical character

recognitionoroptical character reader(OCR) is themechanicalorelectricconversion ofimagesof typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo) or from subtitle text superimposed on an image (for example from a television broadcast)

C. Speech Conversion(GTTs)

(Google's Text To Speech)It is a Python library and CLI tool to interface with Google Translates text-to-speech API. Writes spoken mp3 data to a le, a le-like object (byte string) for further audio manipulation, or studio.

4. Testing:

In this stage,all developed softwares are installed and they are tested in different ways against the system requirements. In this stage we check all this module is working properly or not with proper authentication. Testing the system is working properly or not.

5. Development:

In this development stage we developed the new functionality of each module like object detection and text generation with help of external source and show the resultant voice. We develop all system with proper functions.

6. Maintenance:

According to softwares new version and their use, they need to be updated. In our system, some predefined machine learning libraries need to be used. This system is easy to maintain.

Chapter 5

System Proposed Architecture

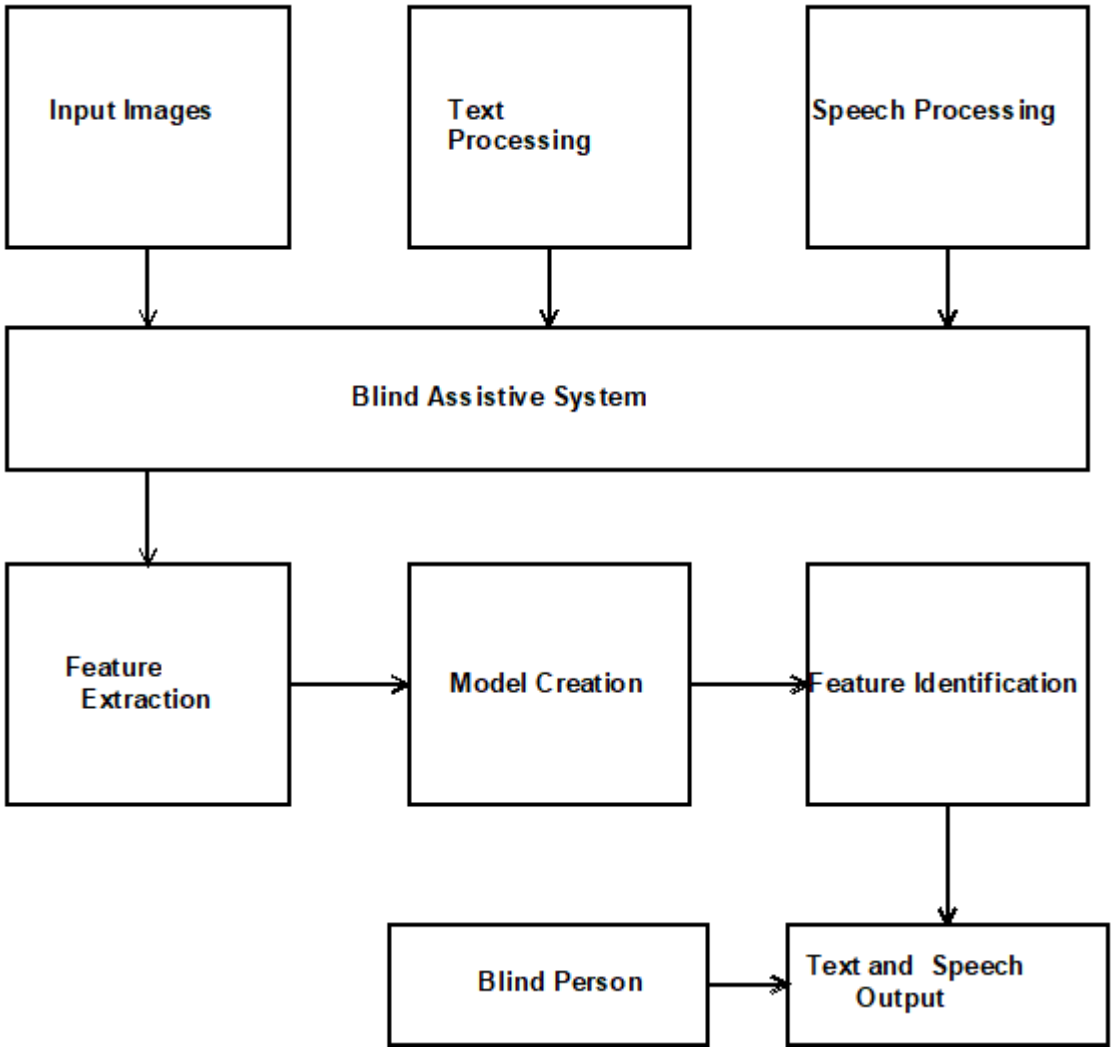


Figure 5.1.1: **System Architecture**

We are going to invent system which will assists blind peoples to read text docu-

ments without any persons help.
Our work is based on machine learning techniques for text reading using OCR tool with better performance and with advantages of voice generation.
We are going to develop following modules:
1) Text reading from images
2) Reading books page by page
3) Reading confidential documents
4) Currency identification for Indian currency
Main motive behind this system is to help blind peoples by reading out all type of text documents.

5.2 Mathematical Model

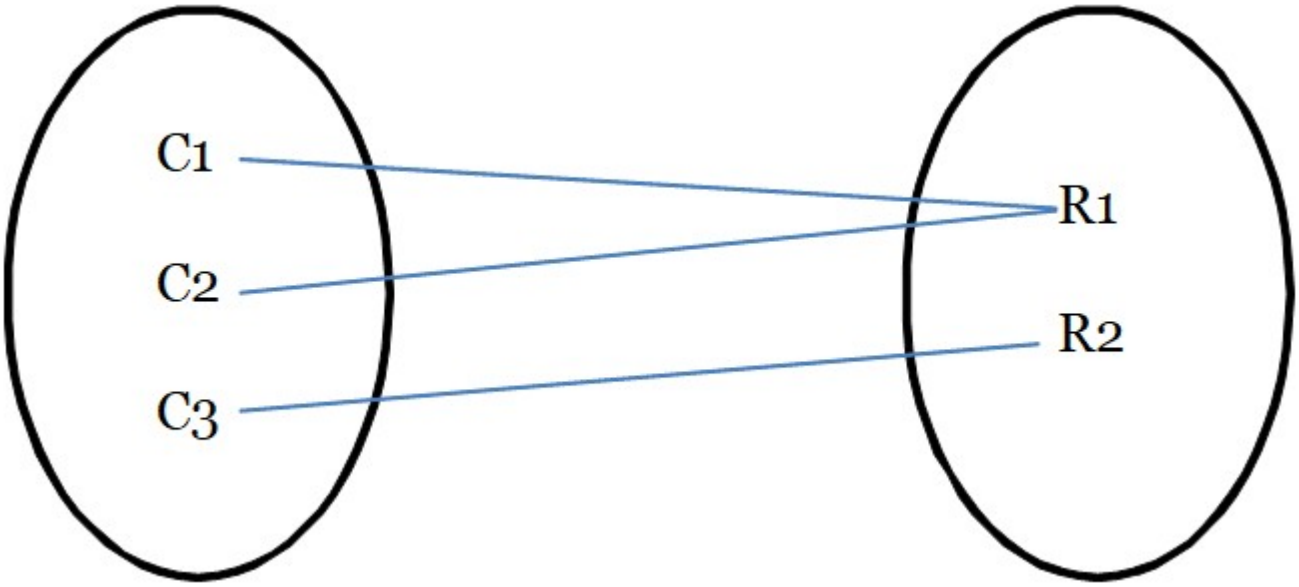


Figure 5.2.1: **Mathematical Model**

Process

Let us consider S as a system for blind assistive system.

Mapping Diagram

C1: text image input
C2: object input

C3: document input
R1: Result of image text generation
R2: Result of object detection
S=I,F,O

INPUT:

F=F1,F2,F3...FN Function to execute result
I=C1,C2,C3... input of systems text images and objects
O=R1,R2Rn
I=result access by User C1=object recognition
C2=text reading from images
C3= document reading
F: F1=Searching wrong vehicle parking by category wise
F2= generate text from images
O: R1= conversion of text to speech
R2=conversion of object detection to voice
Above mathematical model is NP-Complete

SPACE COMPLEXITY:

The space complexity depends on Presentation and visualization of discovered patterns. More the storage of data more is the space complexity.

TIME COMPLEXITY

Check No. of patterns available in the datasets=n If(n¿1)then retrieving of information can be time consuming. So the time complexity of this algorithm is O(nn).
0 = Failures and Success conditions.

Failures:

Huge database can lead to more time consumption to get the information.
Hardware failure.
Software failure.

Success:

High accuracy achieved by using all type of image and object dataset.
User gets result very fast according to their needs.

Chapter 6

High Level Design of Project

6.1 Data Flow Diagrams

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system without going into great detail, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design). A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structured flowchart which focuses on control flow, or a UML activity workflow diagram, which presents both control and data flows as a unified model.

6.1.1 DFD level 0

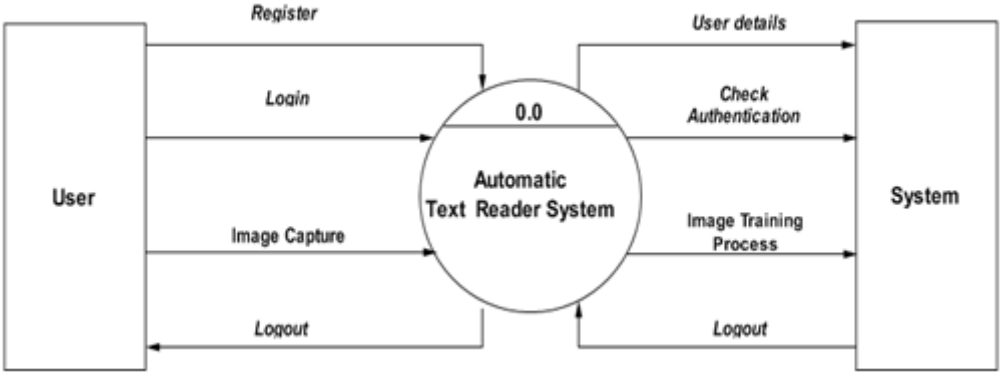


Figure 6.1.1: DFD level 0

6.1.2 DFD level 1

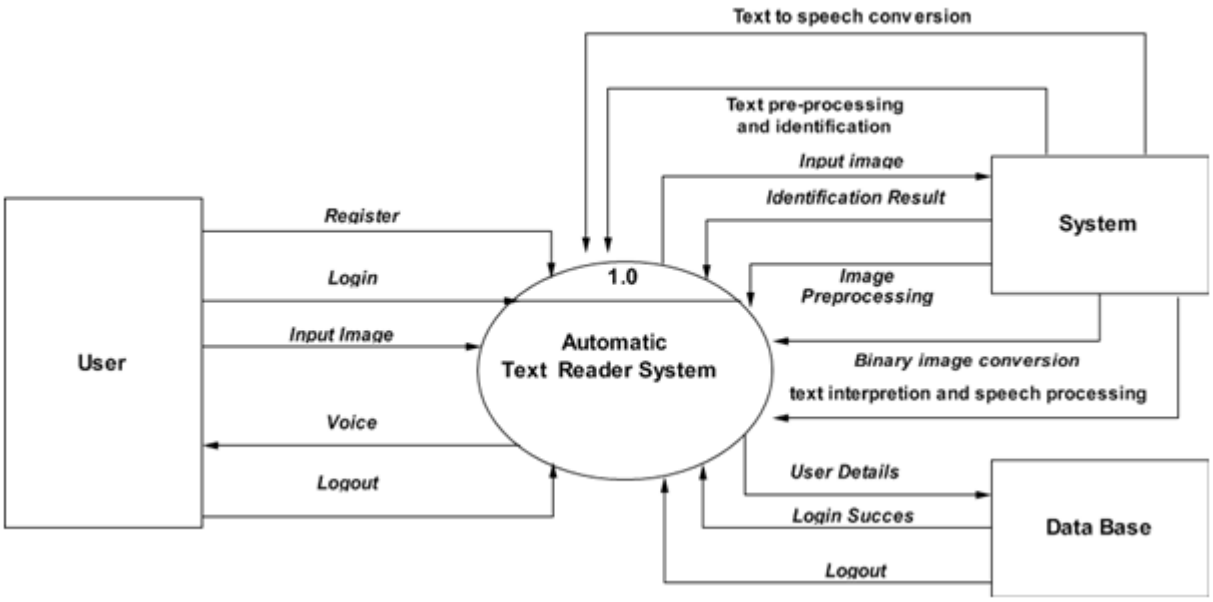


Figure 6.1.2: DFD level 1

6.2 UML

A use case diagram is a graphical representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can show the different types of users of a system and the various ways in which they interact with the system. Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. So when a system is analyzed to gather its functionality use cases are prepared and actors are identified. The purposes of use case diagrams can be as follows:

1) Used to gather requirements of a system.
2) Used to get an outside view of a system.
3) Identify external and internal factors influencing the system.
4) Show the interaction among the actors.

6.2.1 Class Diagram

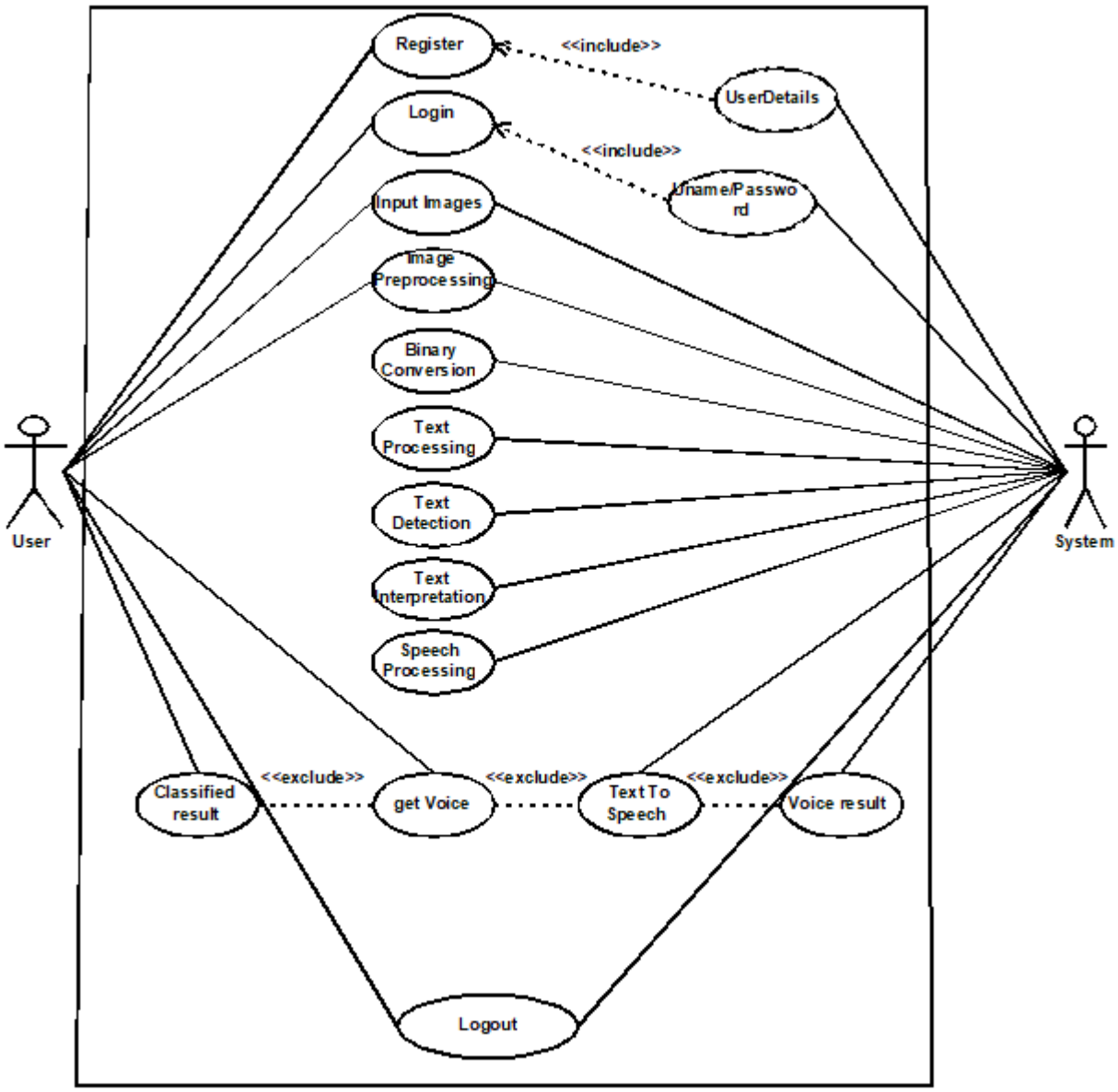


Figure 6.2.1: Class Diagram

6.2.2 Class Diagram

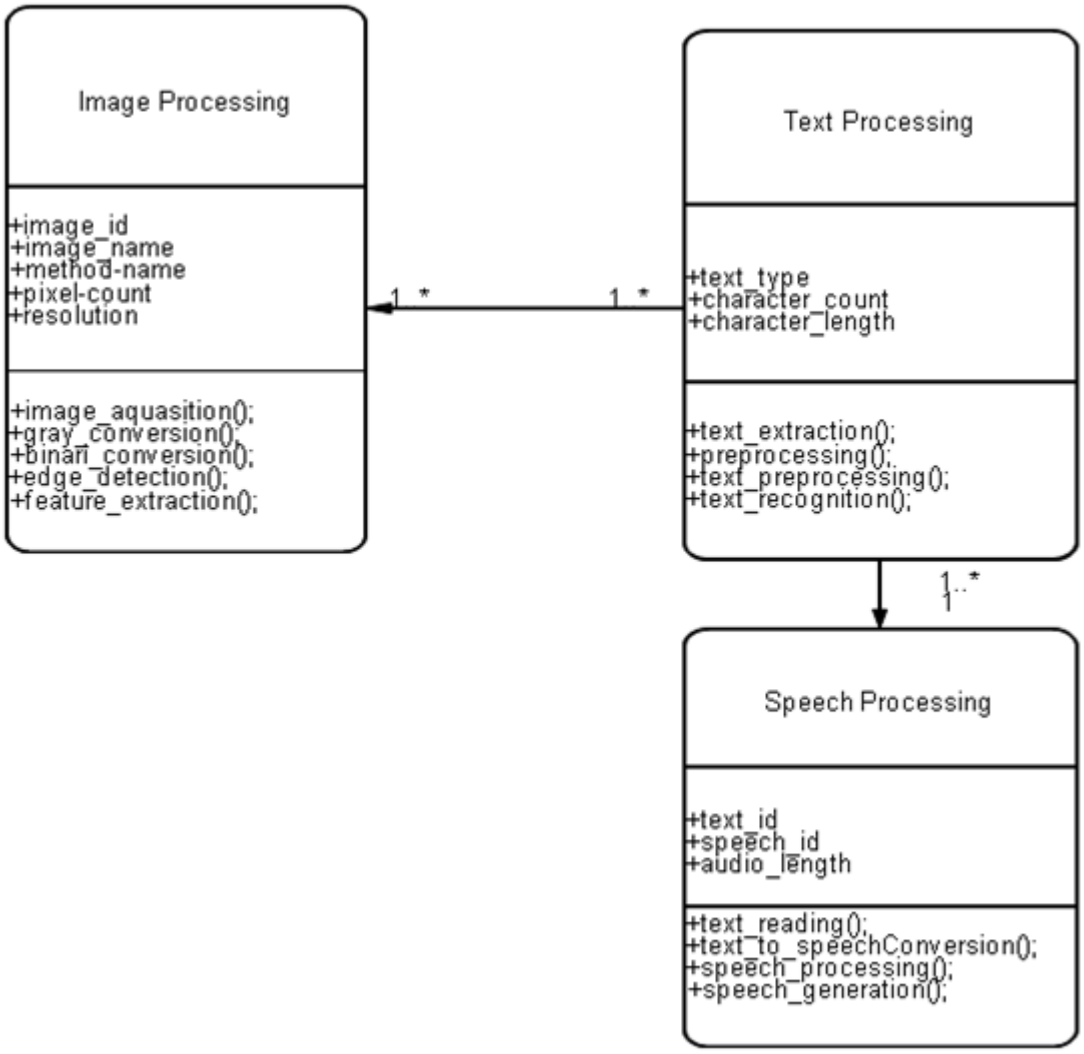


Figure 6.2.2: Class Diagram

6.2.3 Activity Diagram

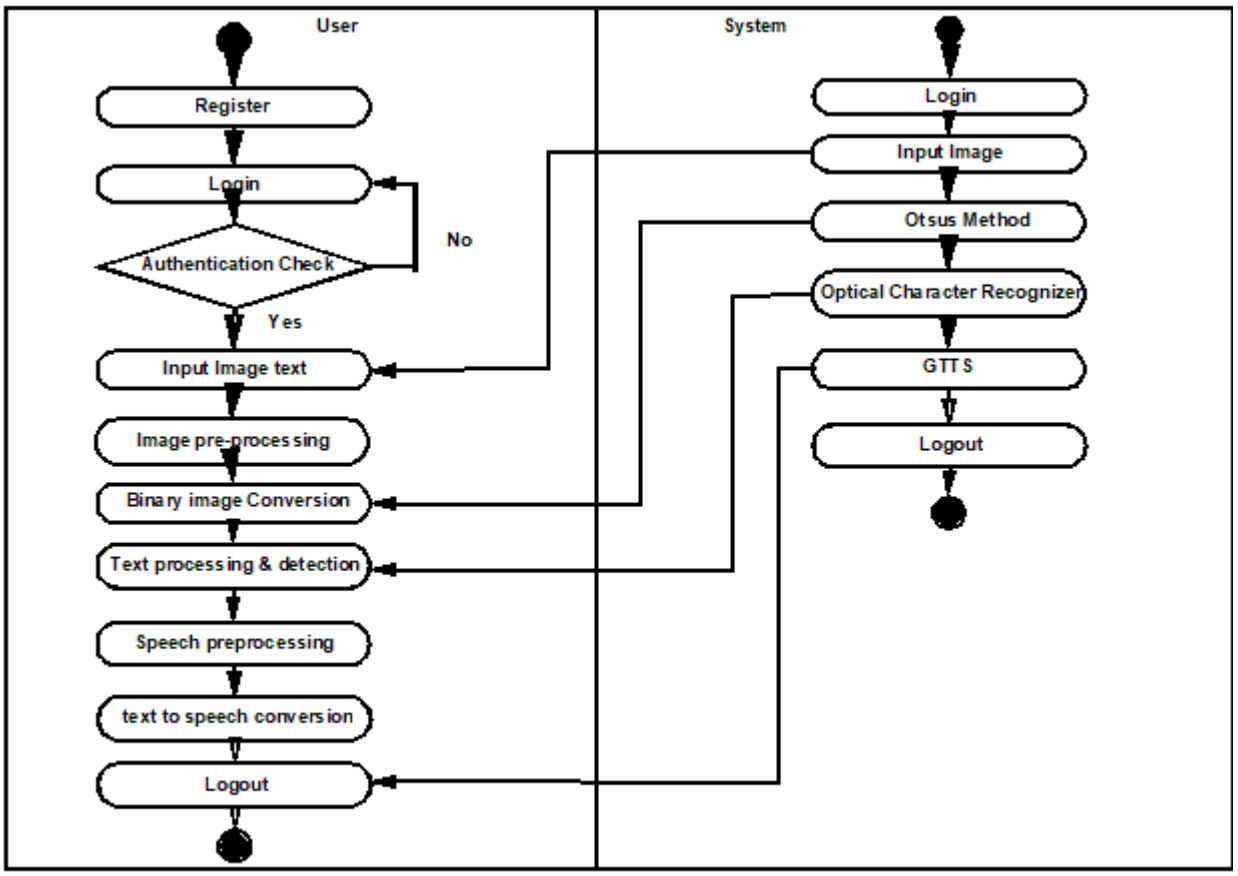
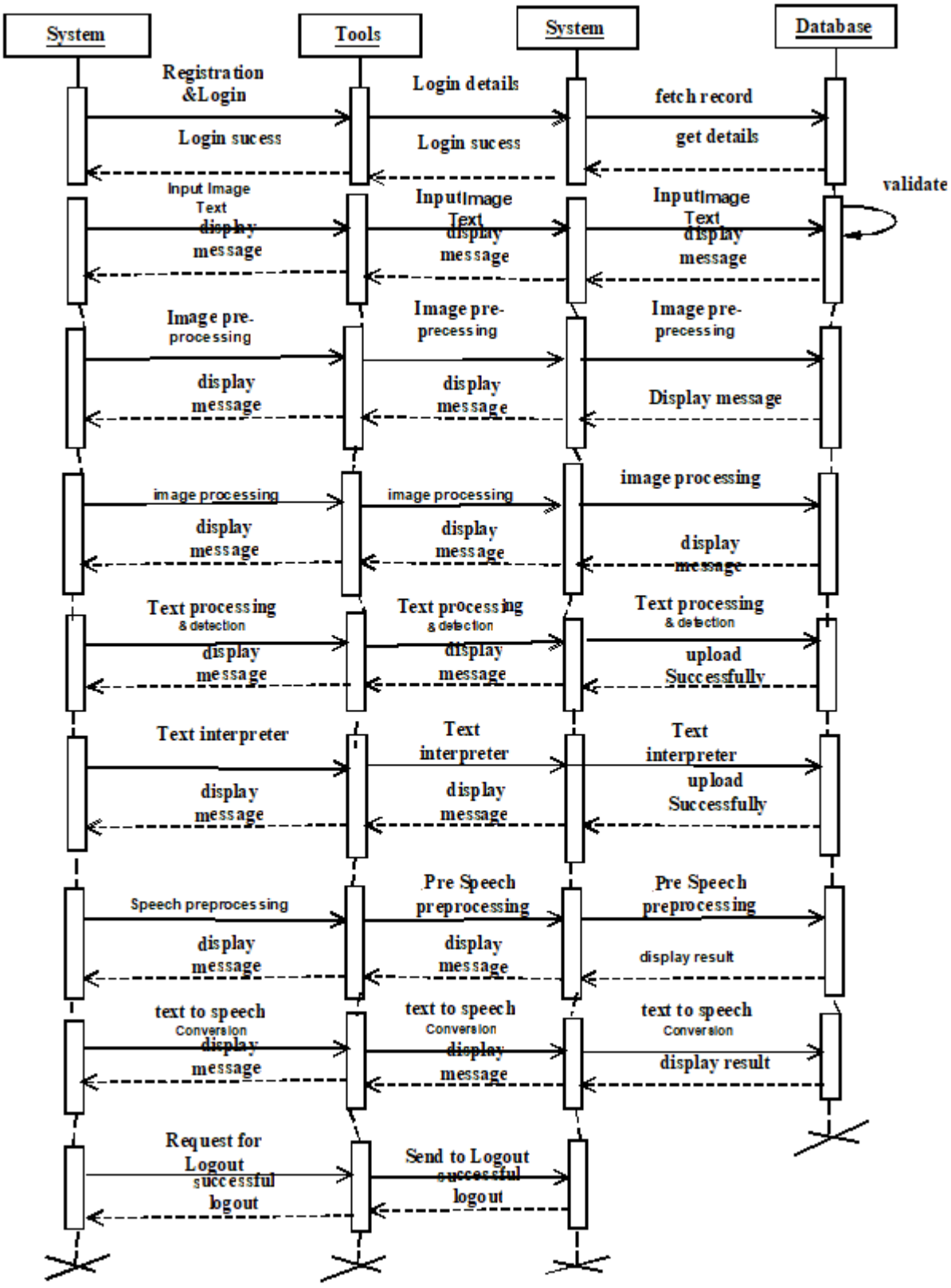


Figure 6.2.3: Activity Diagram

6.2.4 Sequence Diagram



Chapter 7

System Implementation

7.1 Code Documentation

7.2 Algorithm

7.2.1 Gaussian Filtering

Gaussian filtering g is used to blur images and remove noise and detail. In one dimension, the Gaussian function is: Where gamma is the standard deviation of the distribution. The Gaussian filter is a non-uniform low pass filter The kernel coefficients diminish with increasing distance from the kernels centre. Central pixels have a higher weighting than those on the periphery. Larger values of gamma produce a wider peak (greater blurring). Kernel size must increase with increasing gamma to maintain the Gaussian nature of the filter. Gaussian kernel coefficient's depend on the value of gamma. At the edge of the mask, coefficients must be close to 0. The kernel is rotational symmetric with no directional bias. Gaussian kernel is separable which allows fast computation 25 Gaussian kernel is separable, which allows fast computation. Gaussian filters might not preserve image brightness.

7.2.2 K-Convex Hull

The well-known understanding about convex hull is that it is Minimal perimeter problem for sets containing a fixed set and Convex hull Co(E) of E is the bounded connected set constituting a minimization problem . Convex hull algorithms are broadly divided into two categories.

1) Graph traversal

2) Incremental.

The graph traversal algorithms construct CHs by identifying some initial vertices of CH and later finding the remaining points and edges by traversing it in some order. The Gift Wrapping, Graham scan, and Monotone chain are such algorithms. On the other hand, incremental algorithms first and an initial CH and then insert or merge the remaining points, edges or even sub CHs as they are discovered, into current CH sequentially or recursively to obtain the final CH.

7.2.3 (CNN Conventional Neural Network)

Image processing using Conventional neuronal networks (CNN) has been successfully used in various fields of activity such as techniques, civil engineering, mechanics, industrial surveillance, defence department, automatics and transport. Image prepossessing, date reduction, segmentation and recognizer are the processes used in managing images with CNN.

Each input neuron represents colour information in the image, and each output neuron corresponds to an image. All images will be scaled to the same size (width and height) and small to be easy and quick to learn. On the sizes of the images shall be determined on the size of the input vector and the number of neurons. The transfer function for this type of problem is called sigmoid function. The rate of learning has values in the range [0.1] and the error it is recommended to have less than 0.1.

Processing of images with CNN involves different processes, such as:

1) **Image prepossessing**, an operation which shows a picture (contrast enhancement, noise reduction) with the same dimensions as the original image. The objective of images prepossessing with CNN consists in improving, restoring or rebuilding images. The resolved issues are the cartographic types, to optimize a function, an approximation function for the reconstruction of an image.

2) **Data reduction** or feature extraction involves extracting a number of features smaller than the number of pixels in the input window. The operation consists in compressing the image followed by extracting geometric characteristics (edges, corners, joints), facial features, etc.

3) **Segmentation** is a division of an image into regions.

4) **Recognition** involves the determination of objects in an image and their classification.

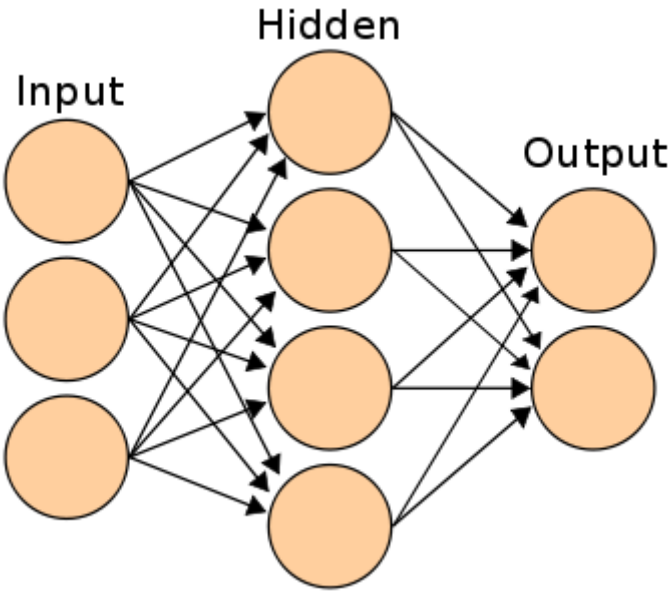


Figure 7.2.1: Conventional Neural Network

Limitations

1) There are some issues related prepossessing of big data set of sign images.
2) There should be need of increase the data set with respect to computational capacity of our system to achieve great accuracy in stage prediction.

Applications

1) Present system is applicable to medical system based on internet.
2) System is also applicable to Medical research and development.

7.3 Methodologies

7.4 Tools and Technologies Used:

7.4.1 Overview

In this section,the author details the technologies that he has used for this project.Although there are many tools that exist out there in the market,the author has found that these tools outlined perform well for the problem that needs to be solved.

7.4.2 Python

Python is a high level interpreted language used for general purpose programming. It is widely used for scientific computing and can be used for a wide variety of general tasks from data mining to software development. Python is the main language used for this project.

7.4.3 Anaconda

Anaconda is a popular data science platform where you can create data science projects and machine learning. Libraries such as NumPy, Pandas, Matplotlib, Tensorflow, etc comes with Anaconda and IDE's such as Jupyter Notebook, Spyder.

7.4.4 Numpy

Numpy is a library in Python that allows for effcient numerical computing in Python. This library is highly optimized to do mathematical tasks. In the project workflow Numpy is heavily used in data pre-processing and preparation of preparation. One of the main features about Numpy is it's highly efficient n-dimensional array(ndarray). Compared to a list in Python a Numpy array can be n-dimensions and has more features associated with the ndarray. Numpy can also perform more efficient mathematical operations compared to the math library in Python.

7.4.5 Pandas

Pandas is also a library in Python, like numpy is also used for data pre-processing and preparation. One of the main features about pandas is the DataFrame and Series data structure. These data structures are optimized and contain fancy indexing that allow a variety of features such as reshaping, slicing, merging, joining and etc to be available. Pandas and Numpy are extremely powerful when used together for manipulating data.

7.4.6 Matplotlib

Matplotlib is a Python plotting library that allows programmers to create a wide variety of graphs and visualizations with ease of use. The great feature about Matplotlib is that it integrates very well with Jupyter Notebook and creating visualizations is simplified. Matplotlib also works very well with pandas and numpy.

7.4.7 OpenCV

OpenCV (Open Source Computer Vision)is a well established computer vision library which is written in C/C++ and has been abstracted to interface with C++, Python and Java. This is a powerful tool when working with images and has a myriad of tools regarding image data manipulation, feature extraction and etc.

7.4.8 Keras

Keras is also Deep Learning Framework that abstracts much of the code in the other Frameworks like Tensorflow and Theano. Compared to the other frameworks Keras is more minimalist.

7.4.9 Jupyter Notebook IDE

The Anaconda distribution comes with a variety of software that includes Jupyter Notebooks for scientific computing. Jupyter Notebooks is an open source software IDE

that allows developers to create and share documents that contain live code and more.

7.5 Tensorflow

TensorFlow is an open source deep learning library by Google. It was originally developed by Google's engineers who were working on Google Brain and has been used for research on machine learning and deep learning. TensorFlow at it's core is about computations of multi-dimensional arrays called tensors but what makes Tensorflow great is its ability to be flexible to deploy computations on different devices such as CPU's and GPU's.

TensorFlow provides all of this for the programmer by way of the Python language. Python is easy to learn and work with, and provides convenient ways to express how high-level abstractions can be coupled together. Nodes and tensors in Tensor Flow are Python objects, and Tensor Flow applications are themselves Python applications.

7.6 Protocols Used

1. cv2.imread();
   This is open-cv function used to read image.

2. cv2.imshow();
   This is open-cv function used to show image.

3. cv2.imwrite();
   This is open-cv function used to write image.

4. cv2.videocapture(0);
   This is open-cv function used to open system camera.

Chapter 8

Working Modules

8.1 GUI of Working Module

Step 1: Download the Python 3 Installer
Open a browser window and navigate to the Download page for Windows at python.org. Underneath the heading at the top that says Python Releases for Windows, click on the link for the Latest Python 3 Release - Python 3.x.x. (As of this writing, the latest is Python 3.6.5.) Scroll to the bottom and select either Windows x86-64 executable installer for 64-bit or Windows x86 executable installer for 32-bit. (See below.)

Step 2: Run the Installer Once you have chosen and downloaded an installer, simply run it by double-clicking on the downloaded file. A dialog should appear that looks something like this:

Install Py charm on windows 10
1. Download the installer .exe. To verify the integrity of the installer, use the SHA checksum linked from the Download page.

2. Run the installer and follow the wizard steps. Mind the following options in the installation wizard 64-bit launcher: Adds a launching icon to the Desktop. Open Folder as Project: Adds an option to the folder context menu that will allow opening the selected directory as a PyCharm project..py: Establishes an association with Python files to open them in PyCharm. Add launchers dir to the PATH: Allows running this PyCharm instance from the Console without specifying the path to it.

When you run PyCharm for the first time, or after you have upgraded it from a

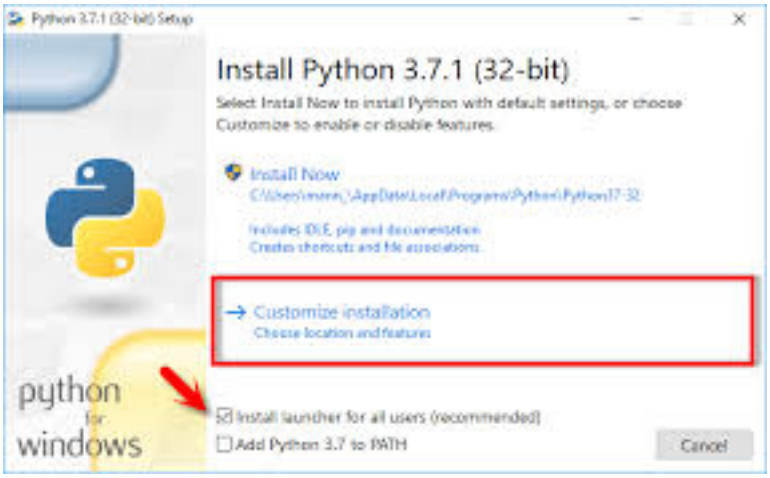


Figure 8.1.1: Python 3x installation

previous version, some steps are required to complete the installation, customize your instance and start working with the IDE. For more information, see Run PyCharm for the first time.

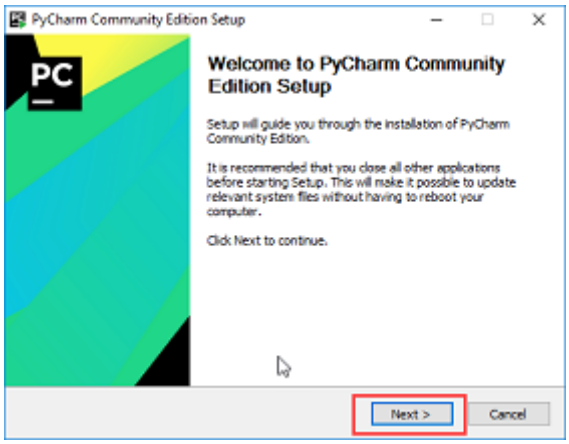


Figure 8.1.2: pycharm installation

8.2 Experimental Results

Opoen-cv

Monty Pythons Flying Circus had a cat detector van so, in this tutorial, we use Python and Open-CV to make our very own cat detector and recognizer. We also cover examples of human face detection and recognition. More generally, we cover a methodology that applies to training a detector (based on Haar cascades) for any class of object and a recognizer (based on LBPH, Fisher-faces, or Eigen-faces) for any unique objects. We

build a small GUI app that enables an LBPH-based recognizer to learn new objects interactively in real time. Although this tutorial uses Python, the project could be ported to Android and IOS using Open-CVs Java and C++ bindings.

GTTS

It is a Python library and CLI tool to interface with Google Translates text-to-speech API. Writes spoken mp3 data to a file, a file-like object (byte string) for further audio manipulation, or studio. There are several APIs available to convert text to speech in python. One of such APIs is the Google Text to Speech API commonly known as the gTTS API. gTTS is a very easy to use tool which converts the text entered, into audio which can be saved as a mp3 file. The gTTS API supports several languages including English, Hindi, Tamil, French, German and many more. The speech can be delivered in any one of the two available audio speeds, fast or slow. However, as of the latest update, it is not possible to change the voice of the generated audio.

Tensorflow

Machine learning is a complex discipline. But implementing machine learning models is far less daunting and difficult than it used to be, thanks to machine learning frameworks. Such as Googles Tensor Flowthat ease the process of acquiring data, training models, serving predictions, and refining future results. Tensor Flow provides all of this for the programmer by way of the Python language. Python is easy to learn and work with, and provides convenient ways to express how high-level abstractions can be coupled together. Nodes and tensors in Tensor Flow are Python objects, and Tensor Flow applications are themselves Python applications.

Chapter 9

Project Plan

• Schedule		Date	Project Activity
July	1st Week	01/07/2019	Formation Of Project Group
	2nd Week	08/07/2019	Project Topic Selection
	3rd Week	15/07/2019	Synopsis Submission
August	1st Week	05/08/2019	Presentation On Project Ideas
	2nd Week	12/08/2019	Submission Of Literature Survey
	3rd Week	19/08/2019	Feasibility Assessment
September	1st Week	02/09/2019	Mid Sem Presentation
	3rd Week	16/09/2019	Design Of Mathematical Model
	4th Week	23/09/2019	End Sem Presentation.
October	1st Week	07/10/2019	Report Preparation And Submission
December	3rd Week	19/12/2019	1st module presentation
	4th Week	26/12/2019	Discussion and implementation of 2nd module
January	1st Week	02/01/2020	Preparation for ANEC conference
	2nd Week	09/01/2020	Study of implementation of user module
	3rd Week	16/01/2020	Discussion about modification to Improve in of user result module.
	4th Week	23/01/2020	1st and 2nd module presentation
	5th Week	30/01/2020	Discussion on flow of project and designing new module
February	1st Week	06/02/2020	Modification of modules.
	2nd Week	13/02/2020	Designed test cases for our module.
	3rd Week	20/02/2020	Worked on user interface.
March	1st Week	06/03/2020	Integration of all modules.
	3rd Week	20/03/2020	Final Report and presentation.

Figure 9.0.1: Project Plan

Chapter 10

Conclusion

We are going to propose assistive system for blind peoples based on machine learning and algorithms.We are going to solve the problem of visually inspired peoples.We are going to develop currency reader, new paper reader, book reader and confidential file reader system.All our implementation based on machine learning and algorithms using OCR tool.

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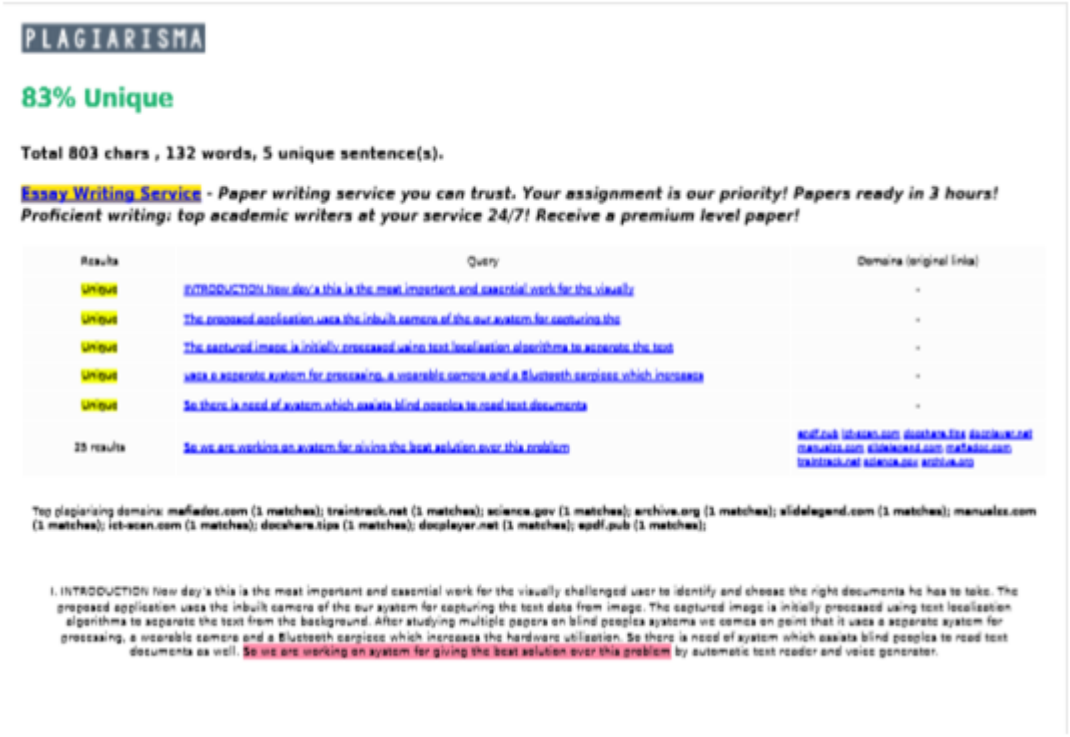
Appendices

A. Plagiarism Report of Paper



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Results	Query	Domains (original links)
Unique	INTRODUCTION Now day's this is the most important and essential work for the visually	-
Unique	The proposed application uses the inbuilt camera of the our system for capturing the	-
Unique	The captured image is initially processed using text localization algorithms to separate the text	-
Unique	uses a separate system for processing, a wearable camera and a Bluetooth earpiece which increases	-
Unique	So there is need of system which assists blind peoples to read text documents	-
25 results	So we are working on system for giving the best solution over this problem	epdf.pub idoceo.com docshare.tips docplayer.net manualzz.com slidelegend.com mafiadoc.com trainteck.net science.gov archive.org

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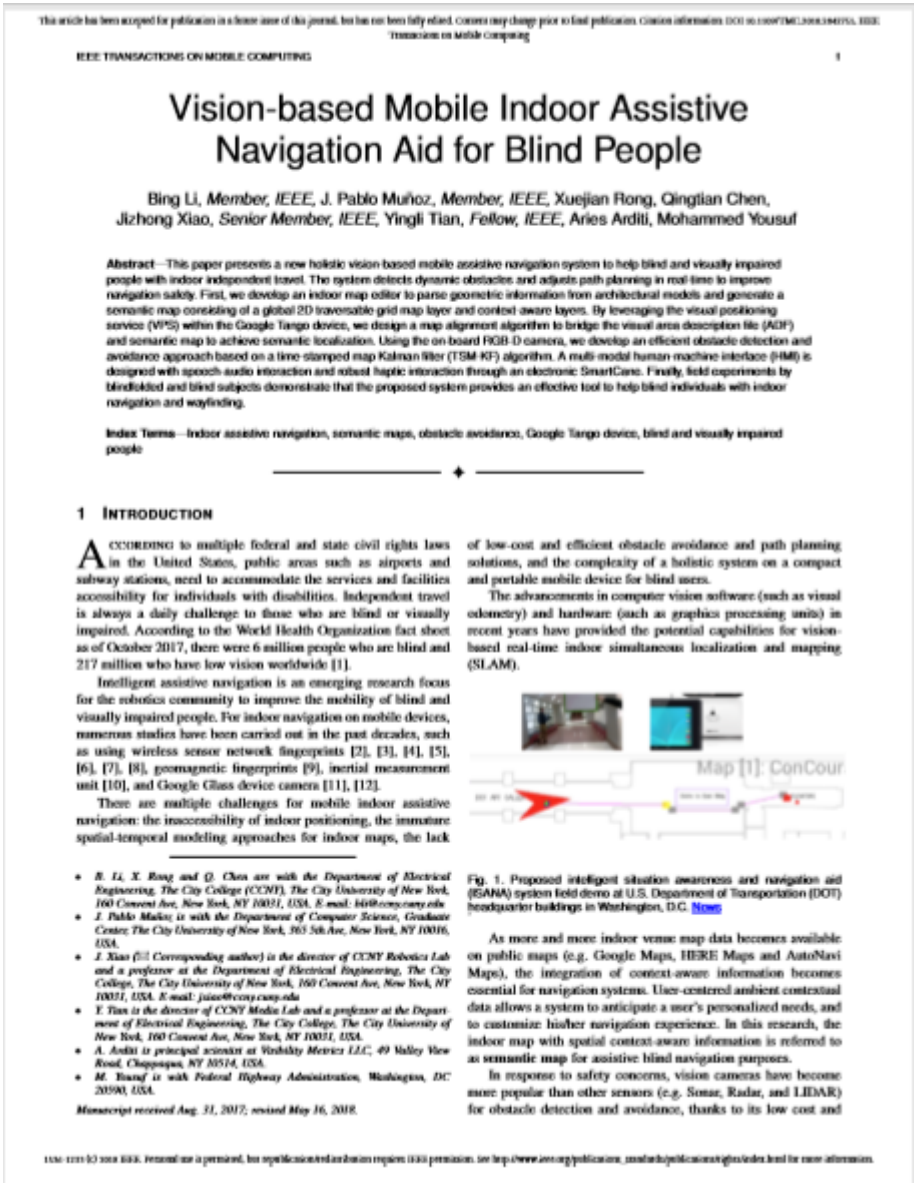
1. INTRODUCTION Now day's this is the most important and essential work for the visually challenged user to identify and choose the right documents he has to take. The proposed application uses the inbuilt camera of the our system for capturing the text data from image. The captured image is initially processed using text localization algorithms to separate the text from the background. After studying multiple papers on blind peoples systems we comes on point that it uses a separate system for processing, a wearable camera and a Bluetooth earpiece which increases the hardware utilization. So there is need of system which assists blind peoples to read text documents as well. So we are working on system for giving the best solution over this problem by automatic text reader and voice generator.

Figure 10.0.1: Plagiarism Report of Paper

B. Base Paper(s)



Vision-based Mobile Indoor Assistive Navigation Aid for Blind People

Bing Li, *Member, IEEE*, J. Pablo Muñoz, *Member, IEEE*, Xuejian Rong, Qingtian Chen, Jizhong Xiao, *Senior Member, IEEE*, Yingli Tian, *Fellow, IEEE*, Aries Arditi, Mohammed Yousuf

Abstract—This paper presents a new holistic vision-based mobile assistive navigation system to help blind and visually impaired people with indoor independent travel. The system detects dynamic obstacles and adjusts path planning in real-time to improve navigation safety. First, we develop an indoor map editor to parse geometric information from architectural models and generate a semantic map consisting of a global 2D traversable grid map layer and context aware layers. By leveraging the visual positioning service (VPS) within the Google Tango device, we design a map alignment algorithm to bridge the visual area description file (ADF) and semantic map to achieve semantic localization. Using the on-board RGB-D camera, we develop an efficient obstacle detection and avoidance approach based on a time-stamped map Kalman filter (TSM-KF) algorithm. A multi-modal human-machine interface (HMI) is designed with speech audio interaction and robust haptic interaction through an electronic SmartCane. Finally, field experiments by blindfolded and blind subjects demonstrate that the proposed system provides an effective tool to help blind individuals with indoor navigation and wayfinding.

Index Terms—Indoor assistive navigation, semantic maps, obstacle avoidance, Google Tango device, blind and visually impaired people

1 Introduction

According to multiple federal and state civil rights laws in the United States, public areas such as airports and subway stations, need to accommodate the services and facilities accessibility for individuals with disabilities. Independent travel is always a daily challenge to those who are blind or visually impaired. According to the World Health Organization fact sheet as of October 2017, there were 6 million people who are blind and 217 million who have low vision worldwide [1].

Intelligent assistive navigation is an emerging research focus for the robotics community to improve the mobility of blind and visually impaired people. For indoor navigation on mobile devices, numerous studies have been carried out in the past decades, such as using wireless sensor network fingerprints [2], [3], [4], [5], [6], [7], [8], geomagnetic fingerprints [9], inertial measurement unit [10], and Google Glass device camera [11], [12].

There are multiple challenges for mobile indoor assistive navigation: the inaccessibility of indoor positioning, the immature spatial-temporal modeling approaches for indoor maps, the lack of low-cost and efficient obstacle avoidance and path planning solutions, and the complexity of a holistic system on a compact and portable mobile device for blind users.

The advancements in computer vision software (such as visual odometry) and hardware (such as graphics processing units) in recent years have provided the potential capabilities for vision-based real-time indoor simultaneous localization and mapping (SLAM).

Fig. 1. Proposed intelligent situation awareness and navigation aid (ISANA) system field demo at U.S. Department of Transportation (DOT) headquarter buildings in Washington, D.C. Now

As more and more indoor venue map data becomes available on public maps (e.g. Google Maps, HERE Maps and AutoNavi Maps), the integration of context-aware information becomes essential for navigation systems. User-centered ambient contextual data allows a system to anticipate a user's personalized needs, and to customize his/her navigation experience. In this research, the indoor map with spatial context-aware information is referred to as **semantic map** for assistive blind navigation purposes.

In response to safety concerns, vision cameras have become more popular than other sensors (e.g. Sonar, Radar, and LIDAR) for obstacle detection and avoidance, thanks to its low cost and

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Manuscript received Aug. 31, 2017; revised May 16, 2018.

Figure 10.0.2: Base Paper

C. Tools Used

10.1 Tools and Technologies Used:

10.1.1 Overview

In this section,the author details the technologies that he has used for this project.Although there are many tools that exist out there in the market,the author has found that these tools outlined perform well for the problem that needs to be solved.

10.1.2 Python

Python is a high level interpreted language used for general purpose programming. It is widely used for scientific computing and can be used for a wide variety of general tasks from data mining to software development. Python is the main language used for this project.

10.1.3 Anaconda

Anaconda is a popular data science platform where you can create data science projects and machine learning. Libraries such

as NumPy, Pandas, Matplotlib, Tensorflow, etc comes with Anaconda and IDE's such as Jupyter Notebook, Spyder.

10.1.4 Numpy

Numpy is a library in Python that allows for effcient numerical computing in Python. This library is highly optimized to do mathematical tasks. In the project workflow Numpy is heavily used in data pre-processing and preparation of preparation. One of the main features about Numpy is it's highly efficient n-dimensional array(ndarray). Compared to a list in Python a Numpy array can be n-dimensions and has more features associated with the ndarray. Numpy can also perform more efficient mathematical operations compared to the math library in Python.

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D. Paper Published/Certificate