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ABSTRACT

- In our country 6% of people are visually impaired person and 2.78% of people are not able to speak.

- The vision and voice are the major defect for these two persons.

- Sign way of communication indicates sign languages used by dumb person.

- Sign language is the language of communication for deaf and dumb people.

- Most of these physically impaired communities are dependent on sign language translators to express their thoughts to rest of the world.

- This causes isolation of these people in society. Hence, Sign language recognition is one of the most growing fields of research today.

- A sign language is composed of various gestures formed by physical movement of body parts i.e. hand, arms or facial expressions..

- In this project, a method is proposed that makes the use of hand gestures for recognition of indian sign language.

- Hand gesture recognition system provides us an innovative, natural, user friendly way of interaction with the computer which is more familiar to the human beings.

- The communication between the dumb and visually impaired person are made only by their expressions and their hand gestures.

- This project presents various methods of hand gesture and sign language recognition for blind and dumb person.
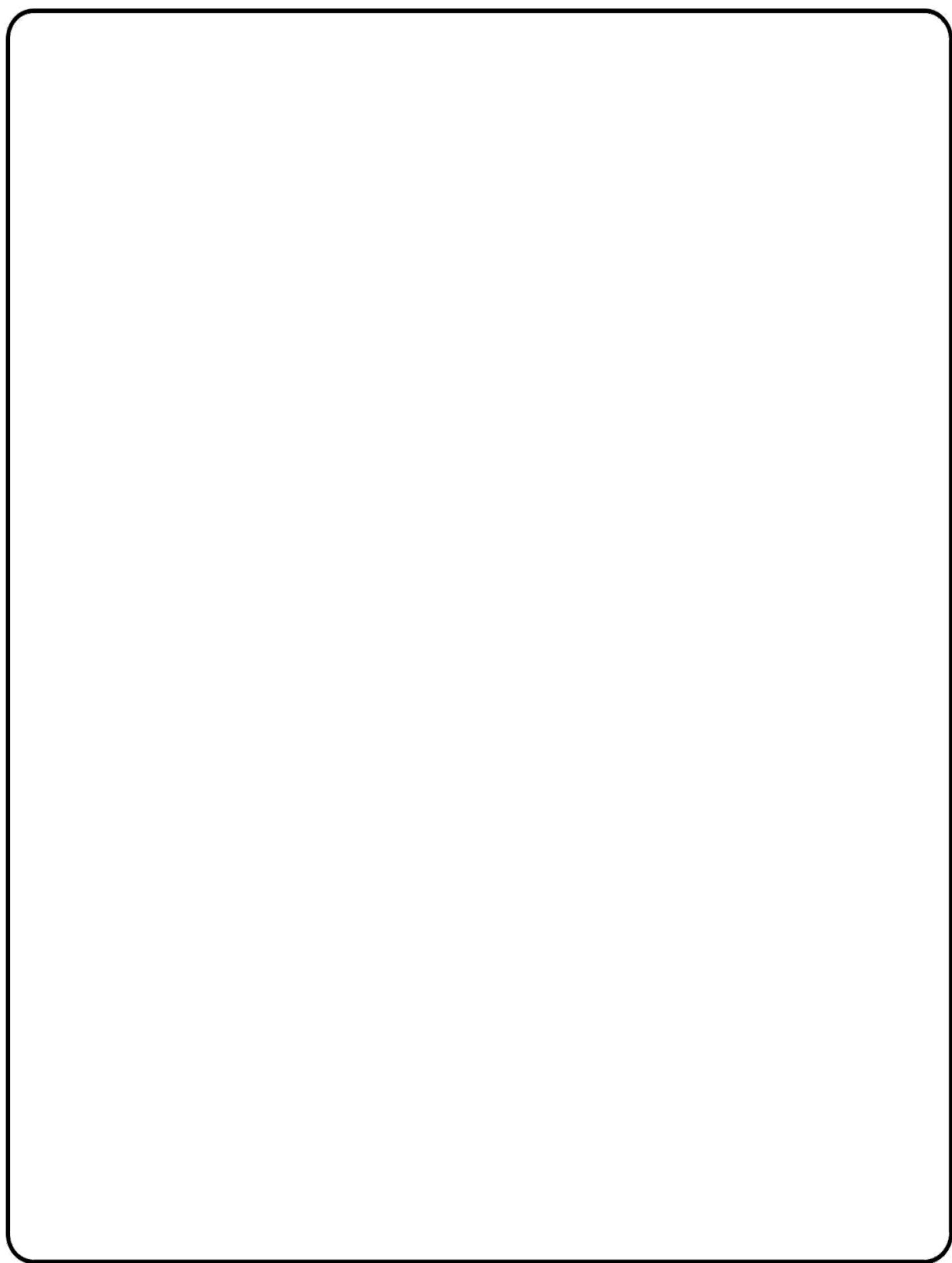
CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Approximately 285 one thousand thousand people are judged to be visually impaired worldwide in which 39 million are blind and 246 are said have low vision. Approximately 90% of this world's visually impaired is from the dispirited income people and 82% of people living with blindness aging persons and above. The numbers of people visually impaired from eye related diseases have been brought down in the past 20 years according to global estimated work. In which 80% of all visual restitution can be prevented or cured. India is considered to be the home for the world's largest act of blind people. In this world, about 37 million are blind, in which 15 million are from India. There are so many researches have been getting along in this universe, but the visual impairment could not be broken for good. In lodge to facilitate these people we have developed the assistive device for blind people who does not want the assistance of other neighbors. The development our project helps the multitude to experience loose and go independently.In all around the world about 9.1 billion people are deaf and mute. In their daily life they face plenty of problems on their communication. Sign language is a linguistic process which is employed for communication among the normal people and handicapped people. Sign language relies on sign patterns such as body language of the person and movements of the arm to facilitate the discernment between the great unwashed. The deaf and vocally impaired people don't simply have to learn the customized sign language, but the core issue is that they can communicate with the usual sort of multitude in the society. It is similarly not possible for all the masses to learn the sign language to understand whatever is said through gestures. Therefore, the communication gaps still exist between the deaf and dumb people. Dumber people can simply tilt the message by sign language which could not be understandable by other people.In resolving these difficulties with visually and vocally impaired people we have used the tiny credit card sized computer named raspberry pi. By this device we provide the solution for blind, deaf and dumb people.

1.2 RELEVENCE

The sign language translation system translates the normal sign language to speech and hence makes the communication between normal person and dumb people easier. Many research works related to Sign languages have been done as for example the American Sign Language, the British Sign Language, the Japanese Sign Language, and so on. Finding an experienced and qualified interpreters every time is a very difficult task and also unaffordable. Automated speech recognition system which aims to convert the speech signals into text form. Hence the two way communication is possible between deaf-mute person and normal person. Gesture recognition is a topic in computer science

and language technology with the goal of interpreting human gestures via mathematical algorithms.

1.3 SUMMARY

The proposed system is very simple and easy to implement as there is no complex feature calculation, no significant amount of training or post- processing required. This system provides us with high gesture recognition rate with accuracy 80% within minimal computation time. Sign language is a useful tool to ease the communication between the deaf person and normal person. The system aims to lower the communication gap between deaf people and normal world, since it facilitates two way communications. The projected methodology interprets language into speech. The system overcomes the necessary time difficulties of dumb people and improves their manner.
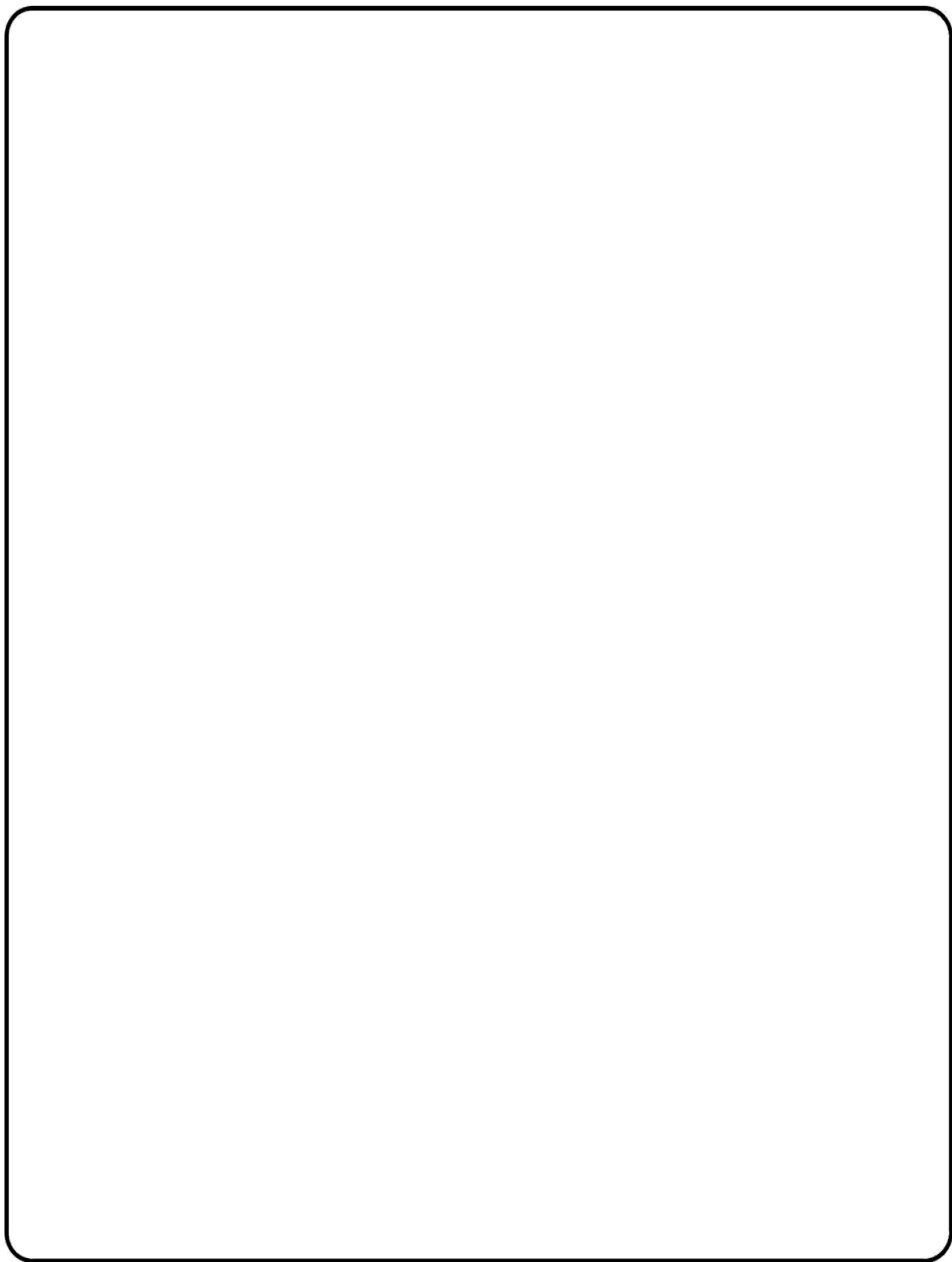
CHAPTER 2

LITERATURE SURVEY

2.1 SURVEY 1

[1] Shweta Sonajirao Shinde ,Dr. R.M. Autee developed real time hand gesture recognition and voice conversion system for deaf and dumb person based on image processing proposed system which is very simple and easy to implement as there is no complex feature calculation, no significant amount of training or post- processing required. This system provides us with high gesture recognition rate with accuracy 80% within minimal computation time. Sign language is a useful tool to ease the communication between the deaf person and normal person. The system aims to lower the communication gap between deaf people and normal world, since it facilitates two way communications

2.2 SURVEY 2

[2] Shiyam Raghul M, Surendhar K , Suresh N, R. Hemalatha developed Raspberry-Pi Based Assistive Device for Deaf, Dumb and Blind People system in which they designed the prototype model for blind, deaf and dumb people by employing a single compact device. The important key factor of this project to facilitate these people and to fix them more confident to manage their sites by themselves. The primary advantage is that the device can be taken away easily and is of about less weight.

2.3 SURVEY 3

[3] Manisha U. Kakde1, Amit M. Rawate developed Hand Gesture Recognition System for Deaf and Dumb People Using PCA in which Sign language recognition system for deaf and dumb people is done using image processing was successfully executed with high accuracy. The method gives output in text and speech format that helps to reduce the communication gap between deaf –mute and normal people. Thus the implementation of system output is done in MATLAB environment.

2.4 SURVEY 4

[4] Fan-Tien Cheng propose a platform denoted Advanced Manufacturing Cloud of Things (AMCoT) to achieve the reasons for Industry 4.0 as well as accomplish the point of Zero Defects by relating the innovation of Automatic Virtual Metrology (AVM). In that capacity, by applying Industry 4.0 together with AVM to achieve the goal of Zero Defects, the period of Industry 4.1 is

occurring. The idea of Industry 4.1 that contains Industry 4.0 together with AVM to accomplish the objective of Zero Defects is proposed in this paper. Regardless, the alleged CPA is built up to help as the empowering operator of IoT and CPS. At that point, AMCoT is created grounded on CPAs to develop different CPS through the innovation of cloud producing. Finally, AMCoT together with AVM is applied for the applications of WMA to achieve the aim of Zero Defects.

CHAPTER 3

DESIGNS AND DRAWINGS

3.1 INTRODUCTION

According to the following steps, our system can be managed significantly well.

BLOCK DIAGRAM

FIG 1.1 TRAINING MODULE
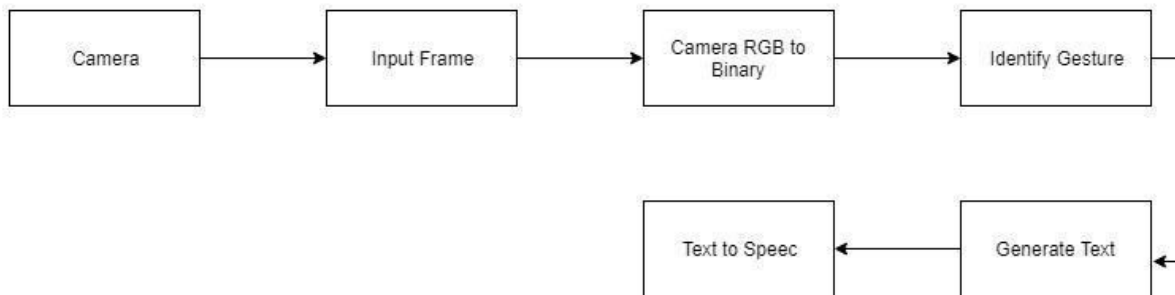
FIG 1.2 WORKING MODULE

3.2 BLOCK DIAGRAM DISCRIPTION

First we have to create database of gesture for raspberry pi. At the time of giving gesture it is necessary to interface the camera. Camera interfacing is use to capture the frames continuously and gives the captured frames to the next phase that is RGB to Binary conversion phase. Here RGB to grey and then grey to binary conversion takes place.The hand gesture is compared with the database that is identify the gesture and generate text. The Google text to speech recognition is used to convert the text into voice for that we can interface speaker or headset to raspberry pi.

3.3 Flowchart

```
                          ┌──────────────┐
                          │   TKINTER    │
                          └──────────────┘
         ┌────────────────────────┼────────────────────────┐
         ▼                        ▼                        ▼
  ┌──────────────┐         ┌──────────────┐         ┌──────────────┐
  │  BUTTON_1    │         │  BUTTON_2    │         │  BUTTON_3    │
  └──────────────┘         └──────────────┘         └──────────────┘
         ▼                        ▼                        ▼
  ┌──────────────┐         ┌──────────────┐         ┌──────────────┐
  │IMAGE TO VOICE│         │ TEXT TO VOICE│         │ VOICE TO TEXT│
  └──────────────┘         └──────────────┘         └──────────────┘
         ▼                        ▼                        ▼
  ┌──────────────┐         ┌──────────────┐         ┌──────────────────┐
  │Call imgtotext()│       │Call texttovoice()│     │Set minimum energy│
  └──────────────┘         └──────────────┘         │thershold         │
         ▼                        ▼                  └──────────────────┘
  ┌──────────────┐         ┌──────────────────┐              ▼
  │Capture the   │         │Giving the text as│      ┌──────────────────┐
  │image         │         │a input           │      │Input is given to │
  └──────────────┘         └──────────────────┘      │microphone        │
         ▼                        ▼                  └──────────────────┘
  ┌──────────────┐         ┌──────────────────┐              ▼
  │Covert the text│        │Using espeak synth│      ┌──────────────┐
  │using tesseract│        │convert text to   │      │Speak now     │
  └──────────────┘         │voice             │      └──────────────┘
         ▼                  └──────────────────┘              ▼
  ┌──────────────┐                 ▼                  ┌──────────────────┐
  │Print the text│         ┌──────────────┐           │Recognize the     │
  └──────────────┘         │ speaking     │           │source            │
         ▼                  └──────────────┘           └──────────────────┘
  ┌──────────────┐                                            ▼
  │Call texttovoice()│                             ┌──────────────────┐
  └──────────────┘                                 │   If the         │
         ▼                                         │   voice is       │
  ┌──────────────────┐                             └──────────────────┘
  │Using espeak synth│              ┌─────────────────────┼──────────────────┐
  │convert text to   │              ▼                     ▼                  ▼
  │voice             │        ┌──────────┐        ┌──────────────┐   ┌──────────────┐
  └──────────────────┘        │ clear    │        │UnknownValueErr│  │Request Error │
         ▼                     └──────────┘        │or            │   └──────────────┘
  ┌──────────────┐                  ▼              └──────────────┘          ▼
  │ speaking     │            ┌──────────────┐            ▼          ┌──────────────────┐
  └──────────────┘            │Print the text│     ┌──────────────┐  │Couldn't request  │
                              └──────────────┘     │Didn't catch  │  │results from      │
                                                   │that          │  │Google Speech     │
                                                   └──────────────┘  │Recognition       │
                                                                     └──────────────────┘
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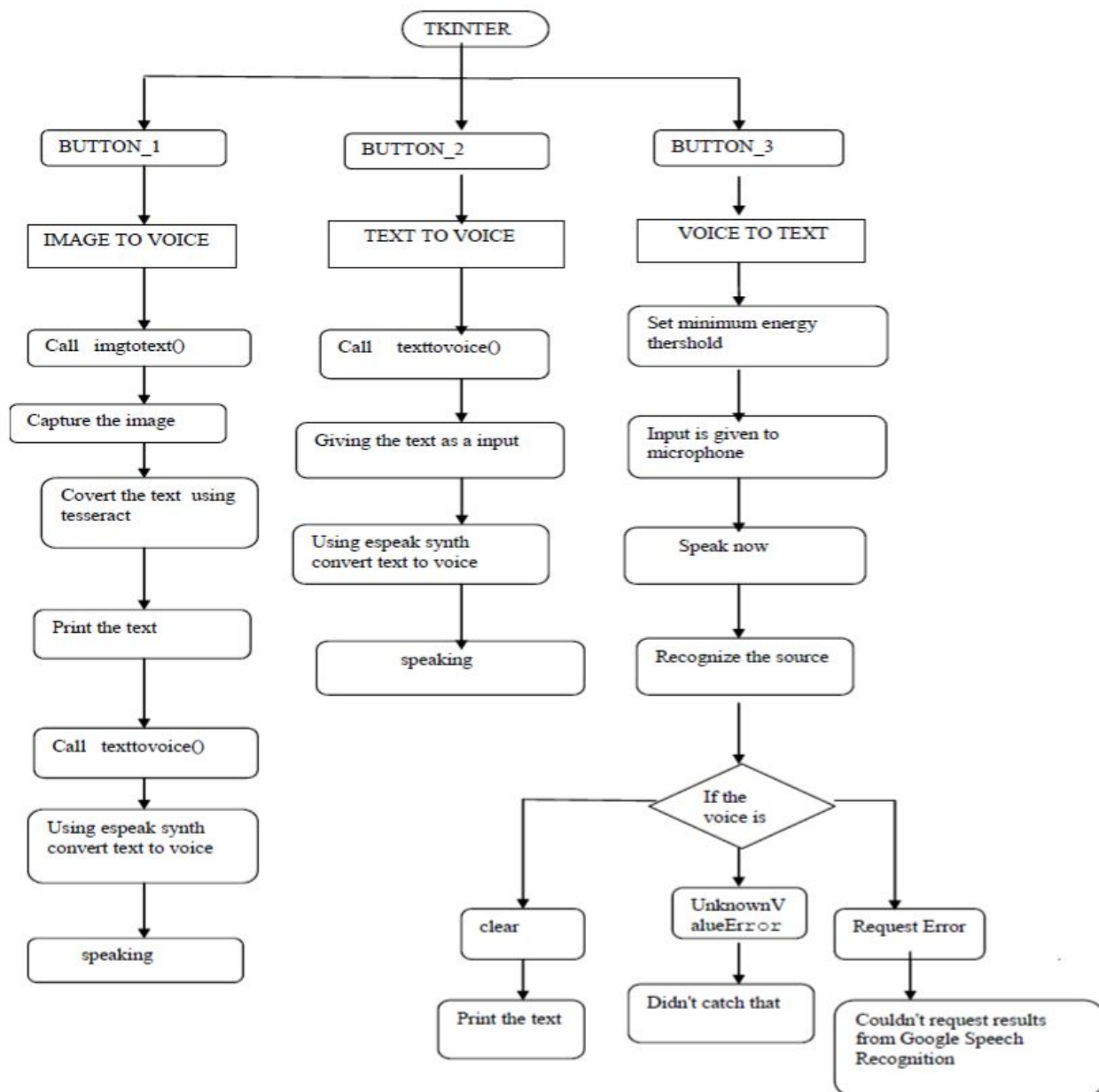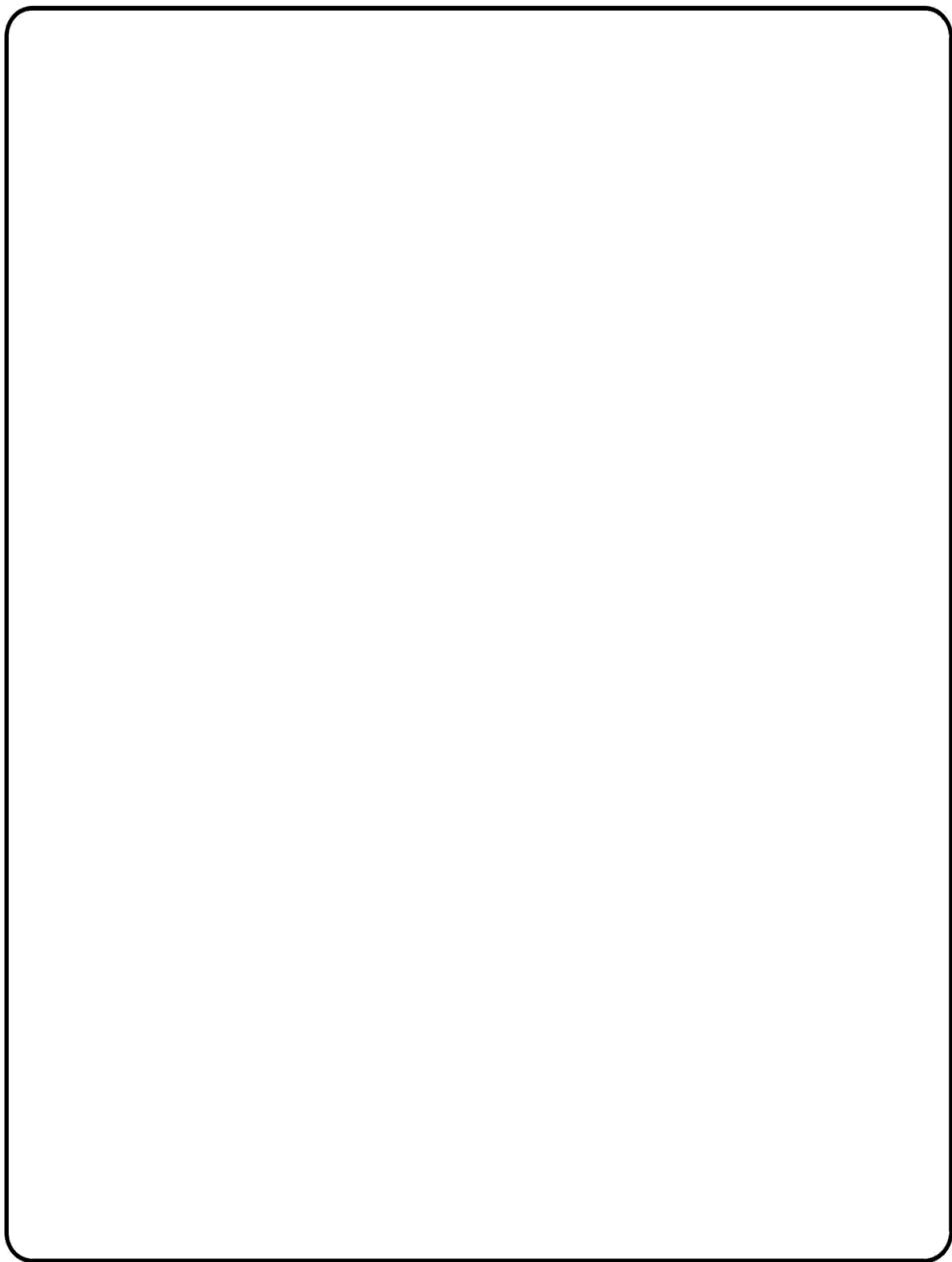
FIG. 2 FLOWCHART

CHAPTER 4

ADVANTAGES AND DELIVERABLES

4.1 ADVANTAGES

• Easy to communicate.

• User-friendly.

• Gesture input.

4.2 FUTURE SCOPE

Further this project can be followed out with any other advanced devices by using simple coding language to get it less complicated. The complication can be reduced by a tiny gadget which could be more useful those people in this electronic world.
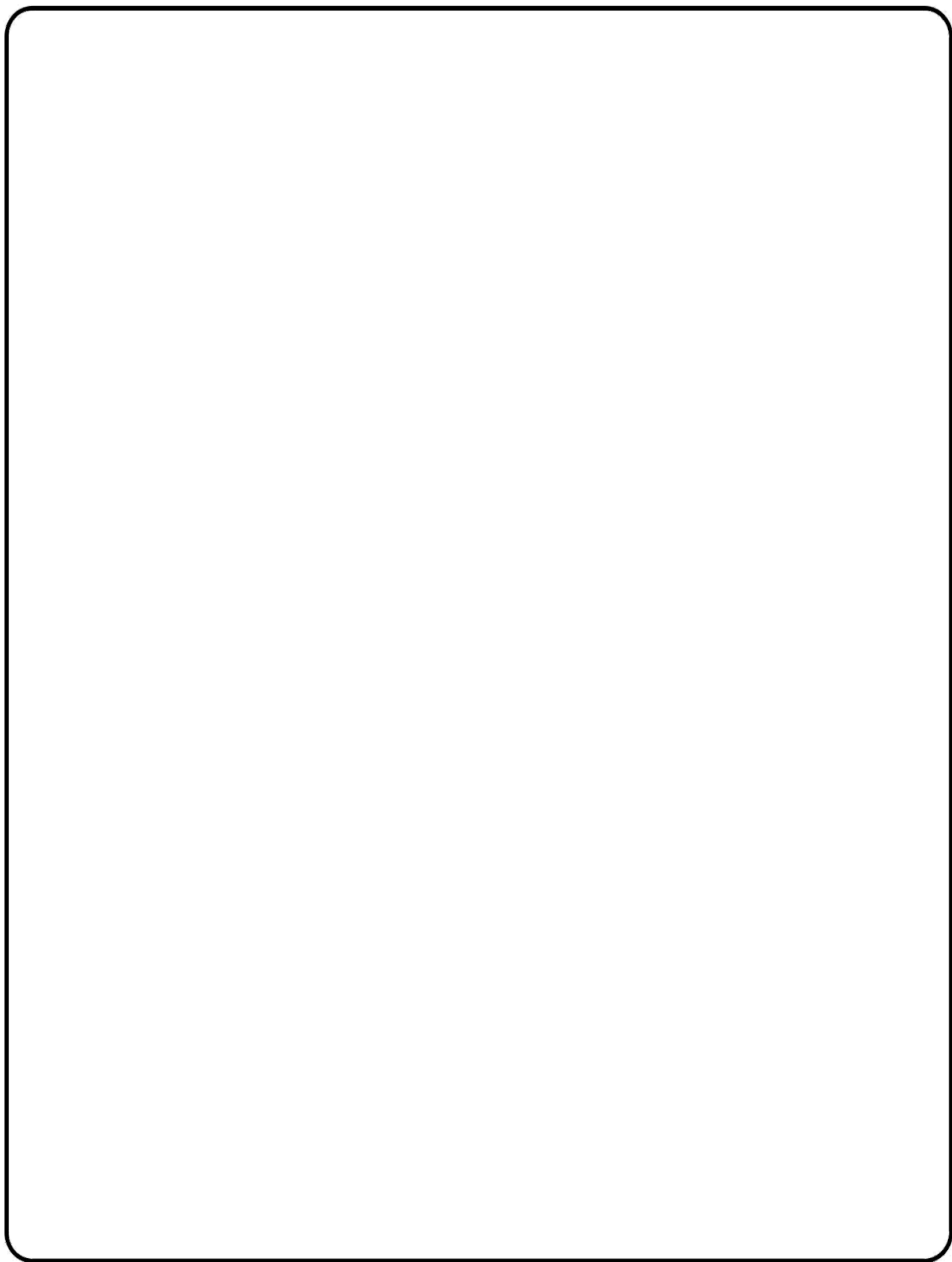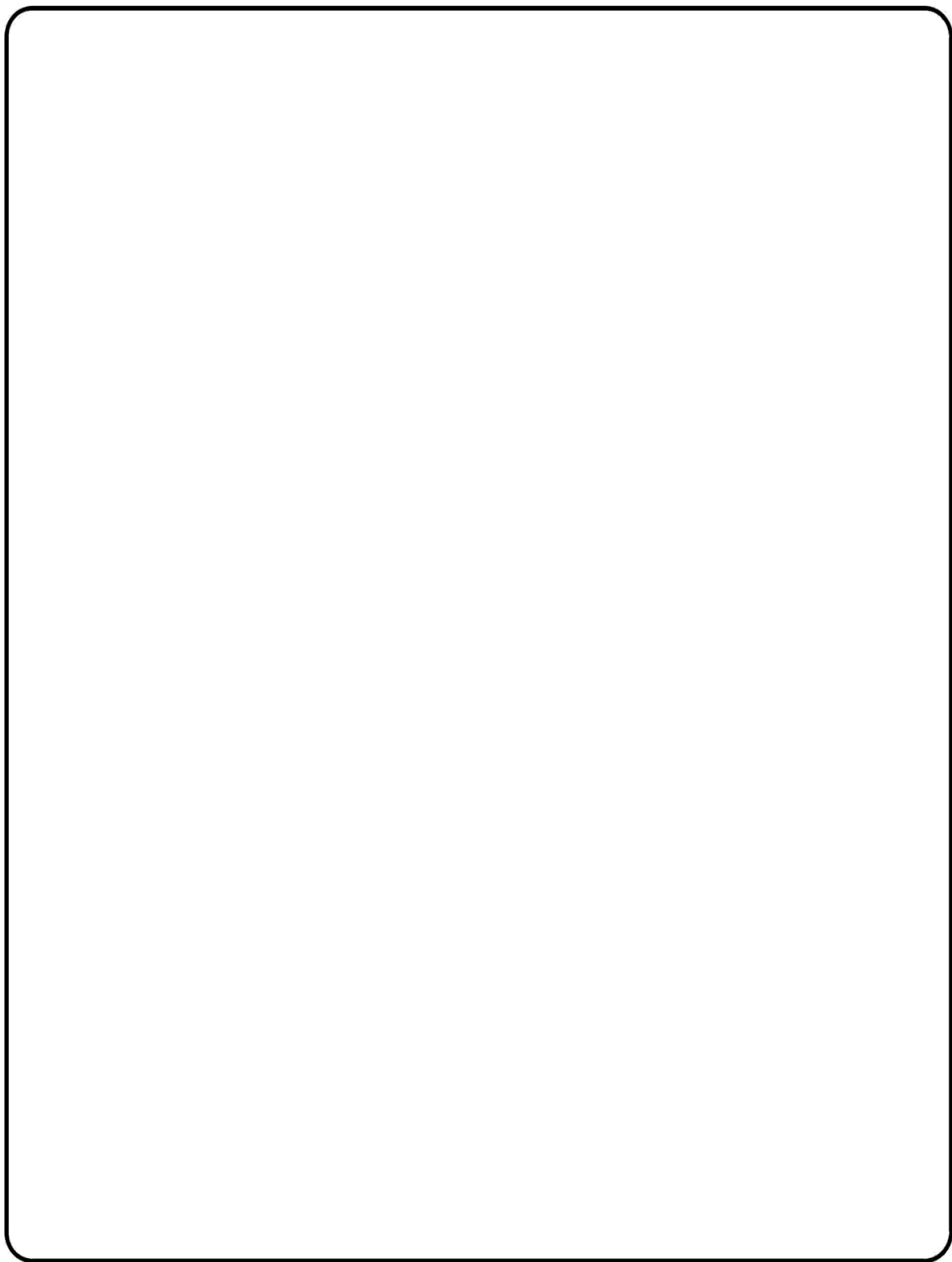
CHAPTER 6

CONCLUSIONS

5.1 CONCLUSIONS

• Image processing using python becomes extremely error free and independent on the lightning conditions.

• Using python techniques we have successfully executed the gesture recognition for the deaf and mute people.

• Further using the text to speech converter module, we can also convert the signs into the sensible audio outputs which will be played back from the   computer speaker.

• This technique is totally independent on lightning conditions and will perform similar on low light situations.

• This makes it a robust image processing application. Throughout this project, it is accurate enough for many real life applications, which makes the python a powerful and useful software in many research fields.

• The project proposed a natural gesture based communication with deaf and mute people.

CHAPTER 6

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