Software Requirements Specification

for

Talk2Mute

Prepared by Group-25

Computer Science and Engineering, JEC

13-01-2021

Table of Contents

1. Introduction 1
   1.1 Category 1
   1.2 Purpose 1
   1.3 Intended Audience and Reading Suggestions 1
   1.4 Product Scope 1
   1.5 References 1
2. Overall Description 2
   2.1 Product Perspective 2
   2.2 Product Features 2
   2.3 User Classes and Characteristics 2
   2.4 Operating Environment 3
3. External Interface Requirements 3
3.1 Software Interfaces 3
4. System Features 3
   4.1 Description and Priority 3
   4.2 Functional Requirements 3
5. Other Nonfunctional Requirements 4
   5.1 Performance Requirements 4
   5.2 Extensibility 4
   5.3 Efficiency 4

1. Introduction

1.1 Category

Web Application

1.2 Purpose

The aim of this document is to specify the features and requirements of the final product "Talk2Mute". It will explain the scenario of the desired project and the necessary steps in order to succeed in the task. To do this, throughout the document, overall description of the project, the definition of the problem that this project presents a solution and that are relevant to the project will be provided.The preparation of this SRS will help consider all of the requirements before design begins, and reduce later redesign,recoding,and retesting. Any change in thefunctional requirements or design constraints part will be stated by giving reference to this SRS in the following documents.
.

1.3 Intended Audience and Reading Suggestions

Sign language is an incredible advancement that has grown over the years. Unfortunately, there are some drawbacks that have come along with this language. Not everyone knows how to interpret a sign language when having a conversation with a deaf and dumb person. There is always a need to communicate using sign language. One finds it hard to communicate without an interpreter. To solve this, we need a product that is versatile and robust. We need to convert the sign language so that it is understood by common people and will help them to communicate without any barriers. This project is intended to help and eliminate the barrier between the deaf & dumb and the rest

1.4 Product Scope

The scope of this project includes the development of sign language translator “Talk2Mute” medium for the communication of speech-impaired to communicate with world. The main objective is to translate sign language to text and speech. The framework provides a helping-hand for speech-impaired to communicate with the rest of the world using sign language. This leads to the elimination of the middle person who generally acts as a medium of translation. This would contain a user-friendly environment for the user by providing speech and regional language text output for a sign gesture input.

1.5 References

Websites and Research Paper

https://ieeexplore.ieee.org/document/7353332
https://ieeexplore.ieee.org/document/7449921
https://ieeexplore.ieee.org/document/7800427

2. Overall Description

2.1 Product Perspective

2.1.1 Existing System

- Existing systems include recognition systems with sensors and external hardware like gloves, which are both expensive and not user friendly
- While it displays the corresponding text, it does not provide the regional language text and audio output

2.1.2 Proposed System

- In this project we utilize the concepts of Machine Learning and Image Processing for the classification of the hand shown gestures
- Here, the gesturesinputthrough the web camera will be identified and gives out a text (both English and regional) and speech output for better understanding of the sign language

2.2 Product Features

- Make the deaf & dumb communicate with others in a very comfortable way
- Gives out text as well as speech output
- Further, one can opt for regional language text output if needed

2.3 User Classes and Characteristics

User of this project should be able to understand the different gestures being conveyed by speech-impaired people. Audio and text output is provided for the corresponding input gestures captured through a webcam. Users can also opt for regional language text output.

2.4Operating Environment

Operating System Server: Windows 10

3. External Interface Requirements

3.1 Software Interfaces

Development Tools: Tensorflow, Jupyter Notebook, MS Visual Studio Code, Translator API

Programming Language: Python

4. System Features

4.1 Description and Priority

This project has high priority because it enables deaf and mute people to communicate with others, share feelings and ideas, actively interact with the society with minimum amount of effort and time. It should be our priority to make everyone have equal means and ways to communicate.The users can easily recognize the gestures throughaudio and regional language text output provided by the system.

4.2 Functional Requirements

4.2.1 User Interface

This is the user interface module where the signerconveys the gestures as input through webcam. The audio and regional language text output is recognized for the various input gestures and gives out to the user as output.

4.2.2 Data Pre-processing and Feature Extraction

By capturing the images using a webcam, various sign language gestures are collected. Then image segmentation and feature extraction are done followed by training of dataset by LDA algorithm and get output as text messages.

5.Other Nonfunctional Requirements

5.1 Performance Requirements

This software should identify the gestures accurately and faster. System should also try to minimize error rates.

5.2 Extensibility

The software shall be extensible to support future developments. It can be used as a learning platform to learn the fundamentals of sign languages. It should be extensible to allow face and various gesture recognition features to be added to system.

5.3 Efficiency

The software shall minimize the use of Central Processing Unit (CPU), Graphics Processing Unit and Memory resources on the operating system.