Software Requirements Specification Document

[21: Vivek Ghaisas, Shubham Rathi, Lasya Venneti, Vamshi Palabatla]

Brief problem statement

Our project aims to develop a component of a call center software application that helps analyse the caller's spontaneous reaction based on speech emotion recognition. The product is a speech analytics engine that allows call centers to analyze almost real time audio from calls and help them respond to the instinctive reaction of the callee.

We are constructing an interactive graphical representation of the audio data with the emotional analysis superposed on it, periodically communicating with a server to collect the audio data which generates some basic statistics and sends them to the server.

System requirements

Our work involves creating a functional and interactive UI (hereby referred to as the 'application') that procures its data from two input sources, namely the call centre's server and AksharSpeech's back-end. A desktop application that provides the same has to be created.

As per the current details provided by the client, the production environment will require Python 2.7 installed, as well as some python libraries: wxPython, numpy as of now. Flot.js and nodewebkit are required to get the application working.

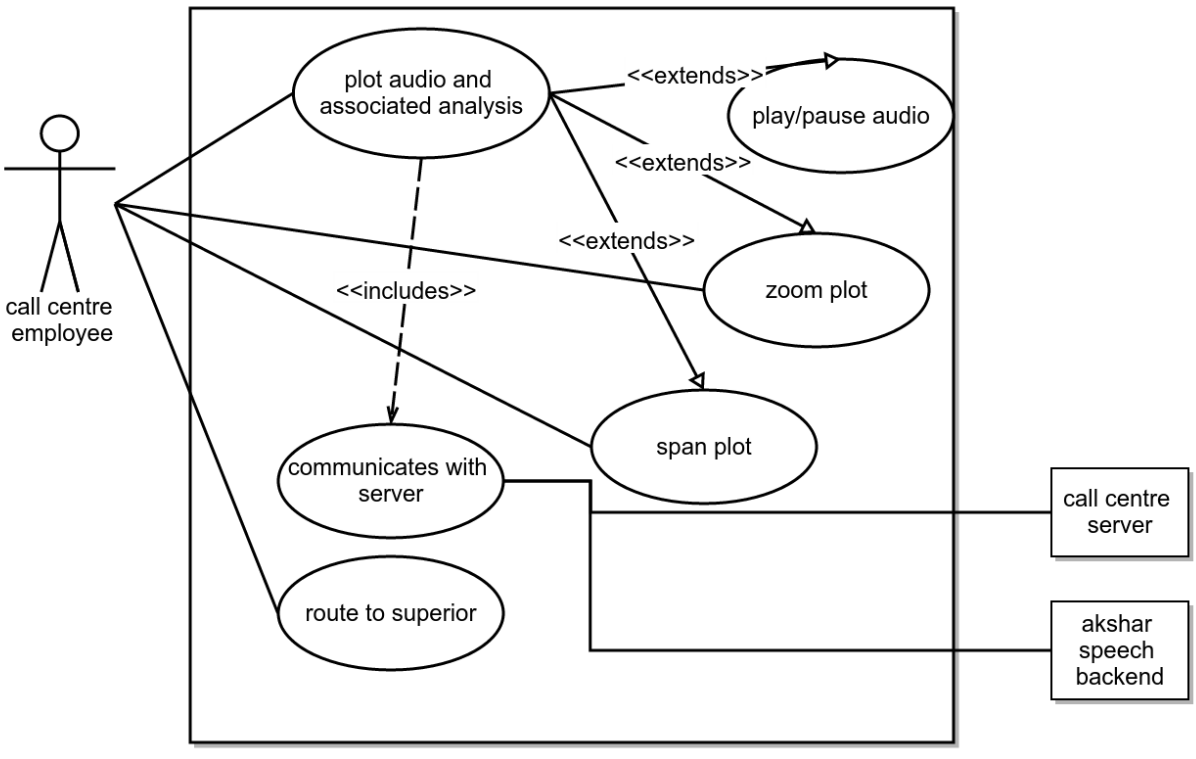
Users Profile

The primary end users for this tool would be call center employees who would be using this tool to differentiate the speech between two basic emotions (for now), 'Angry' and 'Cool'. Supervisor-level personnel would also be using this tool to gain an overview on employee performance as well as call statistics.

Feature Requirements

No.	Use Case Name	Description	Release
1.	plot audio and associated analysis	The audio file and associated data is rendered as an interactive plot.	**R1**
2.	zoom plot	User can zoom in/out of the graph, or fill the screen with a selected portion.	**R1**
3.	span plot	The user can span the zoomed graph	**R1**
4.	play/pause audio	The user can play/pause the audio file	**R2**
5.	server communication	The server will, at regular intervals, provide short audio files to the application along with the 'emodata'. It will also accept generated statistical data.	**R2**
6.	route to superior	When the user's angry levels are increasing continually the call is automatically directed to the supervisor of the call centre	**-**

Use Case Diagram



Use Case Descriptions

Use Case Number	UC-1
Use Case Name	plot audio and associated analysis
Overview	The audio file and associated data is rendered as an interactive plot.
Actors	Call centre employee
Pre condition	The application has the audio file and emodata for a particular period
Flow	**Main flow:** 1. User opens application 2. User selects particular wave file and emodata file to plot 3. Application plots wave file with superposed emodata
Post condition	The wave file and associated emodata are plotted

Use Case Number	UC-2
Use Case Name	Zoom plot
Overview	User can zoom in/out of the graph, or fill the screen with a selected portion.
Actors	Call centre employee
Pre condition	Wave file and associated emodata are plotted
Flow	**Main flow:** 1. User indicates intention to zoom using zoom buttons or mouse wheel 2. Plot gets zoomed
	Alternate flow: 1. User selects part of the plot to zoom 1.1. User indicates intention to zoom using 'fit to' button 1.2. Return to 2
Post condition	Relevant portion of plot is zoomed to fill the plot area

Use Case Number	UC-3
Use Case Name	Span plot
Overview	The user spans the zoomed plot
Actors	Call centre employee
Pre condition	Plot area is filled with zoomed plot
Flow	Main flow: 1. User indicates intention to span using span buttons or dragging the zoomed plot 2. Plot moves in the direction that user indicates
Post condition	Plot moved in direction indicated by user

Use Case Number	UC-4
Use Case Name	Play/pause audio
Overview	The user can play/pause the audio file
Actors	Call centre employee
Pre condition	Audio file and associated data has been plotted
Flow	**Main Flow:** 1. User clicks play/pause 2. Audio file plays/pauses
	Alternate Flow 1: 1. User selects particular part of plot 1.1. Back to 1
Post condition	Audio plays/pauses

Use Case Number	UC-4
Use Case Name	Communicate with server

Overview	The server will, at regular intervals, provide the application with short audio files and will expect some generated statistics.
Actors	Backend server
Pre condition	Server has audio file and emodata ready
Flow	**Main Flow:** 1. Predecided time interval passes 2. Application attempts to contact server 3. If server responds, application fetches the audio file from the server along with the 'emodata'. 4. Local processing takes place 5. Application attempts to contact server 6. If server responds, generated statistics uploaded to server
	Alternate Flow 1: 3. Server does not respond while downloading 3.1 Try again at one second intervals, thrice. 3.2. If the server still doesn't respond, report an error to the user 3.3 If during any attempt the server responds, continue with step 4. **Alternate Flow 2:** 5. Server does not respond while uploading 5.1 Keep trying at one second intervals 5.2. If the server doesn't respond after 3 tries, report a warning to the user that does not block the rest of the application and continue trying at one second intervals 5.3 If during any attempt the server responds, continue with step 6.
Post condition	Server receives generated statistics

Use Case Number	UC - 5
Use Case Name	Route to superior
Overview	When the user's angry levels are increasing continually the call is automatically directed to the supervisor of the call centre
Actors	Call centre supervisor
Pre condition	Emodata shows increased frequency of caller being angry
Flow	**Main flow:** 1. Application detects increased frequency of caller being

	angry 2. Application notifies call centre server 3. Call centre server responds with supervisor's chosen action 4. Supervisor chooses to handle call 5. Notify call centre employee that his/her call has ended
	Alternate flow: 4. Supervisor chooses not to handle call 4.1. Call centre employee is notified of supervisor's decision
Post condition	1. Call transfers to supervisor 2. (Alternate flow) Supervisor and call centre employee are notified