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Test Plan, Test Design Specifications and Test Cases
Version 1

CENG 408
Innovative System Design and Development II

SPEECH EMOTION RECOGNITION

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1. INTRODUCTION

1.1 Version Control

Version No	Description of Changes	Date
1.0	First Version	Apr 7, 2023

1.2 Overview

This test plan covers testing the features and functionality of the Speech Emotion Recognition system. The scope of testing includes verifying users' ability to upload audio files, recognize emotions from uploaded files, correctly handle errors, and respond to user inputs. In addition, the test will also test system performance under different load and usage scenarios. Testing will be performed on the latest version of the system using the most widely used web browsers on Windows, macOS and Linux operating systems. Compatibility of the system with various operating systems and web browsers will also be tested.

1.3 Scope

This test plan covers the testing of the Speech Emotion Recognition system's features and functionalities as well as the corresponding test cases. The scope of the testing includes verifying the system's ability to import audio files, recognize emotions from the uploaded files, handle errors appropriately, and maintain responsiveness to user inputs. Additionally, the testing scope will cover the system's performance under various loads and usage scenarios. The latest version of the system will be used for testing on Windows, macOS, and Linux operating systems using the most commonly used web browsers. Compatibility testing will also be performed to ensure that the system works on various operating systems and web browsers.

1.4 Terminology

Acronym	Definition
TDS	Test Design Specification
GUI	Graphical User Interface
HP	Home Page
LG	Login Page
SP	Speech Page
TP	Text Page

Acronym	Definition
RP	Result Page
SER	Speech Emotion Recognition
UAT	User Acceptance Test

2. FEATURES TO BE TESTED

This section lists and gives a brief description of all the major features to be tested. For each major feature there will be a Test Design Specification added at the end of this document.

2.1 Home Page

- **Speech Button Functionality:** The feature of this button tests whether the user has been successfully transferred to the "Speech Page".

- **Text Button Functionality:** The feature of this button tests whether the user has been successfully transferred to the "Text Page" section.

- **Speech and Text Emotion Recognition:** This button will redirect you to the homepage of the Speech Emotion Recognition system.

- **System Response:** This feature tests the responsiveness of the SER system to user actions and inputs.

2.2 Login Page

- **Email Textbox Functionality:** It is the field where a valid email account that users have used actively before is entered in order to log in to the system.

- **Password Textbox Functionality:** It is the place for users to enter their passwords that match the email they entered while registering to the system so that they can log in to the system.

- **Sign-up Button Functionality:** It is a button that users who will use the system for the first time can use to create a new account if there is no account created in this system.

- **Speech and Text Emotion Recognition:** This button will redirect you to the homepage of the Speech Emotion Recognition system.

- **System Response:** This feature tests the responsiveness of the system to user actions and inputs.

2.3 Speech Page

- **Audio file import:** This feature ensures that the system successfully imports an audio file by loading it to the system.

- **Speech emotion recognition:** This feature tests the accuracy of the system's ability to recognize different emotions in a given audio file.

- **Submit button functionality:** This feature tests the functionality of the Submit button by verifying that it properly initiates the speech emotion recognition test.

- **Error handling:** This feature tests how the system handles errors, such as incorrect file format or upload failure.

- **System responsiveness:** This feature tests the responsiveness of the system to user actions and inputs.

2.4 Text Page

- **Upload Text:** This feature allows the system to successfully import a text by uploading it to the system.

- **Text Emotion Recognition:** This feature tests the accuracy of the system's ability to recognize different emotions in a given text.

- **Submit Button:** This feature tests the functionality of the Submit button by verifying that it properly initiates the text emotion recognition test.

- **System Response:** This feature tests the system's responsiveness to user actions and inputs.

2.5 Result Page

- **Select Button:** This feature allows the user to choose what type of evaluation (speech/text).

- **Evaluate Button:** This feature allows the user to evaluate the mood of the selected genre.

- **System Response:** This feature tests the system's responsiveness to user actions and inputs.

3.   FEATURES NOT TO BE TESTED

- **User interface design and layout:** This includes the visual design of the application, such as the color scheme, layout, and placement of elements on the screen. It is not within the scope of this test plan to evaluate the design of the user interface.

- **Compatibility with specific devices or operating systems:** The application may not be tested on every possible device or operating system, and therefore it is not feasible to guarantee compatibility with all of them. The test plan will focus on testing the application on a representative set of devices and operating systems.

- **Network connectivity and speed:** The performance of the application may be affected by network connectivity and speed, but it is not within the scope of this test plan to evaluate these factors.

- **Security:** While the application may have security features, such as password protection, encryption, and access control, it is not within the scope of this test plan to evaluate these features. Security testing requires specialized skills and tools and should be conducted separately.

4. EXIT CRITERIA

- 95% of the test cases are executed.

- 95% of the test cases passed.

- All defects found during testing are fixed and verified by the development team.

- The system stability and performance meet the agreed-upon requirements.

- The user acceptance test (UAT) is successfully completed and approved by the client.

5. TEST DESIGN SPECIFICATIONS

5.1 Graphical User Interface (GUI)

Describe under what conditions the testing of the product is considered successful. Some examples are:

5.2 Home Page (HP)

The home page is the first page that the user encounters. When Speech logs into the emotion recognition system, he will see this page. This page basically offers the user 2 options. The user can first log in from the "Log in" section and then go to the relevant page by selecting the "Text" section or the "Speech" section.

- **Speech and Text Emotion Recognition:** This page, which is the first and home page of the SER system, is the first page that the user encounters. On this page, the user must first log into his account by clicking the "Log in" button. After logging into his account, he can return to the main page and click on one of the "Speech" or "Text" buttons. After this process, the SER system will provide a return that the user is directed to the relevant page according to his choice.

- **Speech Button Functionality:** This button should be selected by users who want to analyze emotion with speech file in the SER system. After the button is clicked by the user, the SER system shows a message that the user has been successfully redirected to the "Speech" page.

- **Text Button Functionality:** This button should be selected by the users who want to make emotion analysis with a text file in the SER system. After the button is clicked by the user, the SER system shows a message that the user has been successfully redirected to the "Text" page.

- **System Response:** The system should respond appropriately to user actions. After the user clicks the button, the system should respond in the appropriate time frame. The system will only rely on one click in case of multiple button clicks.

5.3 Login Page (LP)

If you do not have an account, you will be directed to the signup page. If a user has been registered before, the system is entered by entering the email and password data. If the same user is to log in with an email, the information comes pre-filled.

- **Email Textbox:** People who want to use the system must register in advance. Filling in the e-mail address they entered while creating the registration is used in this section. It is the field where a valid email account that users used actively before to log in to the system is entered. This allows people to log into their accounts.

- **Password Textbox:** People who do not have an account in the system have to create a password associated with their email account when logging in to them. It is the place where users enter their passwords that match the email they entered while registering to the system in order to log in to the system. In this way, they can log into the system with matching emails and passwords.

- **Remember Me Chechk-box:** Individuals who have created an account in the system have an email address and a password. This button saves the email and password information that users need to enter each time they log in to the system, and prevents them from re-logging in each time.

- **Login Button:** It is the confirmation button that the users have to press in order to enter the system after the email and password text-boxes they have entered into the system.

- **Sign-up Button:** This is the button that users who will use the system for the first time can use to create a new account if there is no account created in this system. In this way, they will be able to create a special session for themselves and use them in their login information.

- **System Response:**The system will be tested for its responsiveness to user actions and inputs. The user will perform various actions on the system such as clicking buttons and entering text. The system should respond to the actions in a timely manner.After the user clicks the button, the system should respond in the appropriate time frame.

5.4 Speech Page (SP)

The Speech Upload Page is designed to allow users to upload audio files to be processed by an AI system. The page includes a "Submit" button that initiates the upload process.

- **Audio file import:**
When the user clicks on the "Upload Audio" button on the main page of the system, he will be able to select an audio file to be uploaded by clicking on the "Choose File" button. Once the user selects the file and clicks on the "Open" button, the system should start uploading the file. Once

the upload is complete, the system should display a success message. The user should then verify that the uploaded audio file is correct.

- **Speech emotion recognition:**
  The user will provide an appropriate audio file for the test and load it into the system. The user will then initiate the speech emotion recognition test by clicking on the Submit button. The system should process the audio file and display the recognized emotion. The user should verify that the recognized emotion is correct.

- **Submit button functionality:**
  The user will provide an appropriate audio file for the test and load it into the system. The user will then click on the Submit button to initiate the speech emotion recognition test. The system should process the audio file and display the recognized emotion. The user should verify that the Submit button initiates the test as expected.

- **Error handling:**
  The system will be tested for its ability to handle errors such as incorrect file format or upload failure. In case the user attempts to upload a file with an incorrect format, the system should display an error message and cancel the upload process. If the user interrupts the upload process before it is completed, the system should display an error message and cancel the upload process.

- **System responsiveness**:
  The system will be tested for its responsiveness to user actions and inputs. The user will perform various actions on the system such as clicking buttons and entering text. The system should respond to the actions in a timely manner. The system's ability to handle multiple user inputs simultaneously will also be tested.

5.5 Text Page (TP)

The Text Upload Page allows users to enter text to be processed by an artificial intelligence system and detect their emotions. The page includes a "Submit" button that starts the upload process. Detailed explanation is given below.

- **Upload Text:** When the user comes to the Text Page, user must enter the text user wants to know the feeling in the relevant field.

- **Text Emotion Recognition:** The user will provide a suitable text input for the test. The user will then click the Submit button to initiate the emotion recognition test from the text. The system should process the text and show the recognized emotion. The user must verify that the recognized emotion is correct.

- **Submit Button:** The user will provide a suitable text input for the test. The user will then click the Submit button to initiate the emotion recognition test from the text. The system should process the text and show the recognized emotion. The user should verify that the Submit button initiates the test as expected.

- **System Response:** The system will be tested for its responsiveness to user actions and inputs. The user will perform various actions on the system, such as clicking buttons and entering text. The system is expected to respond to the actions in a timely and accurate manner as described above.

5.6 Result Page (RP)

The result page, which is the last part of the project, consists of three parts.

- **Select Box:** First of all, user tick the box according to whether you want to know the mood in the speech or in the text.then user press the evaluate button to see the result.

- **Result Table:** Secondly, in the result table, the intensity of emotion in the voice or text selected as a result of the evaluation is shown to the user as a percentage.

- **Result:** Finally, the mood with the highest percentage is selected and displayed to the user on the result screen along with the emoji.

6. DETAILED TEST CASES

6.1 Home Page

Test Scenario	Speech and Text Button Functionality
Purpose	To direct the user to the relevant page when the "Speech" or "Text" button is selected.
Requirements	None.
Priority	Medium.
Estimated Time Needed	1 Minutes
Dependency	Have a user created before and registered in the SER system.
Setup	Logging into the SER system website and logging into the system with user information.
Procedure	Go to Home page.
	Select one of the "Text" or "Speech" buttons and click
	Wait for the SER system to redirect to the relevant page and observe.
Cleanup	Log out of the SER system.

6.2 Login Page

Test Scenario	Login button
Purpose	Provides system login and use
Requirements	Valid email address and password
Priority	High.
Estimated Time Needed	1 Minutes
Dependency	Pre-registration in the system
Setup	Having the email and password used when creating a linked account.
Cleanup	Logout

6.3 Speech Page

Test Scenario	Audio File Import
Purpose	To verify that the system successfully imports an audio file by loading it to the system.
Requirements	An operational system. An appropriate audio file for the test.
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	None
Setup	Open the system and provide the necessary login information.
Procedure	Click on the "Upload Audio" button on the main page of the system.
	Click on the "Choose File" button to select the audio file to be uploaded.
	Select the audio file and click on the "Open" button.
	The system will wait for a while to upload the file. Wait for the process to complete.
	When the upload is complete, the system will display a success message. Make sure the message is displayed.
	Check that the uploaded audio file is correct.
	If the uploaded audio file is correct, click the submit button.
Cleanup	Delete any temporary files generated during the upload process. This will help free up disk space and keep the file system clean.
	If the user logged into the system, log them out to ensure the security of their account.
	Close the system.

6.4 Speech Page

Test Scenario	Audio File Deletion
Purpose	To verify that the system can successfully delete an audio file that has been uploaded to the system.
Requirements	An operational system. An audio file uploaded to the system for testing purposes.
Priority	High.
Estimated Time Needed	3 Minutes
Dependency	Audio File Import test scenario must be completed successfully.
Setup	Open the system and provide the necessary login information.
Procedure	Navigate to the page that displays the uploaded audio files.
	Locate the audio file that was uploaded during the Audio File Import test scenario.
	Click on the "Delete" button next to the audio file.
	The system will ask for confirmation before deleting the file. Click on the "OK" button to confirm.
	Wait for the system to complete the deletion process.
	Verify that the audio file has been successfully deleted from the system.
	If the audio file has been successfully deleted, close the system.
Cleanup	Delete the audio file from the system after verifying the successful.
	Clear the cache and browser history to ensure the test does not interfere with future tests.
	Ensure that all relevant log files and test results are properly documented and saved for future reference.

6.5

6.6 Speech Page

Test Scenario	Submit Button Functionality
Purpose	To verify that the system successfully submits the form data when the Submit button is clicked.
Requirements	An operational system with a form that includes a Submit button. Test data to be submitted with the form.
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	Audio File Import test scenario must be completed successfully.
Setup	Open the system and provide the necessary login information. Successful completion of the Audio File Import test scenario.
Procedure	Click on the "Submit" button on the emotion recognition page of the system.
	The system will perform emotion recognition on the uploaded audio file. Wait for the process to complete.
	When the process is complete, the system will display the recognized emotion. Make sure the emotion is displayed.
	Check that the recognized emotion is correct.
	If the recognized emotion is correct, close the system.
Cleanup	After submitting the speech sample, provide clear feedback indicating that the sample has been received by the system.
	If an error occurs during the processing stage, provide a clear error message indicating the issue and potential solutions.

6.7 Text Page

Test Scenario	Upload Text
Purpose	To verify that the system successfully upload a text by loading it to the system.

Requirements	An appropriate text for the test.
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	Login Page test cases should pass
Setup	Open the system and provide the necessary login information.
Procedure	Go to Text Upload Page.
	Enter a text.
	Click on the "Submit" button.
Cleanup	Delete the text.

6.8 Text Page

Test Scenario	Submit Button
Purpose	To verify that the system successfully submits the form data when the Submit button is clicked.
Requirements	Test data to be submitted with the form.
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	Text Page test cases should pass
Setup	Open the system and provide the necessary login information.
Procedure	Go to Text Upload Page.
	Enter a text.
	Click on the "Submit" button.
	The system will perform emotion recognition on the uploaded text. Wait for the process to complete.
	Check that the recognized emotion is correct.
Cleanup	After submitting the text sample, provide clear feedback indicating that the sample has been received by the system.

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6.10   Result Page

Test Scenario	Result Page
Purpose	Learn the result of emotion
Requirements	Select text or speech
Priority	High.
Estimated Time Needed	5 Minutes
Dependency	Add User test cases should pass
Setup	Open the system and provide the necessary login information. Successful completion of the Audio File Import test scenario.
Procedure	1- Go to result page.
	2- Select the speech or text.
	3- Enter evaluate button.
	4- See percentiles of all emotions.
	5- See real emotion and emoji
Cleanup	Logout

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7. REFERENCES

[1] CENG407_GroupXX_SRS_V1.0, December, 2022

[2] CENG407_GroupXX_SDD_V1.0, December, 2022