

TEST REPORT FOR EMOTION BASED MUSIC PLAYER

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ChangeLog

| Version | Change Date | By | Description |
|----------------|----------------|---------------------------------|---------------------------------|
| version number | Date of Change | Name of person who made changes | Description of the changes made |
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| | | |
|----------|------------------------------------------------------|----------|
| 1 | INTRODUCTION | 2 |
| 1.1 | SCOPE..... | 2 |
| 1.1.1 | <i>In Scope.....</i> | <i>2</i> |
| 1.1.2 | <i>Out of Scope.....</i> | <i>3</i> |
| 1.2 | QUALITY OBJECTIVE | 3 |
| 1.3 | ROLES AND RESPONSIBILITIES | 3 |
| 2 | TEST METHODOLOGY | 4 |
| 2.1 | OVERVIEW | 4 |
| 2.2 | Test Levels..... | 4 |
| 2.3 | Bug Triage..... | 4 |
| 2.4 | Suspension Criteria and Resumption Requirements..... | 4 |
| 2.5 | TEST COMPLETENESS | 5 |
| 3 | TEST DELIVERABLES | 5 |
| 4 | RESOURCE & ENVIRONMENT NEEDS | 8 |
| 4.1 | TESTING TOOLS | 8 |
| 4.2 | TEST ENVIRONMENT | 9 |
| 5 | TERMS/ACRONYMS | 9 |

EXECUTIVE SUMMARY:

The Emosic project aims to create a unique music player that dynamically selects and plays music based on the user's emotions. This testing report provides an overview of the testing process, highlighting the key findings and recommendations.

SCOPE :

When creating a testing report for an emotion based music player, both functional and non-functional requirements are crucial. This ensures the music player is effective, efficient, and meets security standards. Examples of these requirements include:

Functional Requirements:

- **Emotion Recognition:** The system should accurately recognize facial expressions and emotions of the user. It should support a variety of emotions, including happiness, sadness, anger, etc.
- **Music Selection:** Based on the detected emotion, the system should recommend and play music that corresponds to the user's emotional state. The music selection algorithm should consider a diverse range of genres and artists.
- **User Interaction:** The user interface should provide a seamless experience for users to interact with the system. Users should be able to easily navigate through the application, control playback, and adjust settings.
- **Customization:** The system should allow users to customize their preferences regarding music recommendations. Users should have the option to create playlists based on specific emotions or moods.
- **Compatibility:** The music player should be compatible with various platforms, including desktop, mobile, and web browsers. It should support common audio file formats and streaming services.
- **Feedback Mechanism:** The system should provide feedback to users about the detected emotion and the reason behind a particular music recommendation. Users should have the option to provide feedback on the accuracy of the emotion detection and music recommendations.

Non-Functional Requirements:

- **Performance:** The system should respond to user inputs promptly, ensuring minimal latency. It should handle the processing load of emotion recognition and music selection efficiently.
- **Scalability:** The system should scale gracefully to accommodate a growing user base and an expanding music library.

- **Reliability:** The music player should be highly reliable, minimizing disruptions and downtime. should recover gracefully from errors and provide a stable user experience.
- **Security:** User data, including facial expressions, should be handled securely and adhere to privacy standards. The system should be resilient to potential security threats, ensuring the integrity of the user experience.
- **Usability:** The user interface should be intuitive and user-friendly, catering to users of different age groups and technological expertise.
- **Accuracy:** The emotion recognition algorithm should be highly accurate, minimizing false positives and false negatives.

QUALITY OBJECTIVES:

- Ensure the Application Under Test conforms to functional and non-functional requirements.
- Identify and fix bugs/issues before go-live.

TEST METHODOLOGY:

Overview

The decision to adopt a Waterfall methodology is based on well-defined requirements, low uncertainty, regulatory compliance, and large-scale, complex projects.

- **Well-Defined Requirements:** When the project has clearly defined and stable requirements that are unlikely to change significantly throughout the project's lifecycle. Waterfall is suitable when you can gather and document all the requirements up front.
- **Low Uncertainty:** If there is a high level of confidence in the project scope and objectives, and the technology and processes to be used are well-understood, Waterfall can be a good choice. It is less adaptable to uncertainty and change.
- **Regulatory Compliance:** In cases where the project needs to adhere to strict regulatory or compliance standards, Waterfall provides a structured and documented approach that can help meet these requirements.
- **Large-Scale and Complex Projects:** Waterfall can be beneficial for large-scale, complex projects where a comprehensive and detailed project plan is essential for successful execution.

TEST LEVELS:

Testing involves unit testing, integration testing, and system testing:

- **Unit Testing:**

1. Emotion Detection Validation- Tests the emotion detection model
 2. Music Recommendation validation- Test the music suggestion according to emotion detected.
- Integration Testing:
Rule Interaction: Validates the efficient communication of the various models which includes face recognition and detecting emotion and playing music on the basis of emotion detected.
 - System Testing:
Rule Coverage: Validate the Streamlit webapp that is going to produce the output on the basis of what model has generated the results.
 - Test Completeness:
100% test coverage.
All faces are verified at different angles and different visibility.

TEST DELIVERABLES:

- Test Plan
- Test Cases and Test Scripts
- Test Reports
- Defect Reports
- Resource & Environment Needs

TESTING SCOPE:

The testing focused on the following key areas:

- Emotion detection accuracy
- Music recommendation accuracy
- User interface functionality
- Performance under various system conditions
- Error handling and resilience

TESTING APPROACH:

- **Manual Testing:** Testers manually validated the emotion detection and music recommendation features under different scenarios.

TEST CASES AND RESULTS:

Set of images for each category (neutral, sad, surprise and happy) are saved in the model for comparison purposes. The model will compare the loaded image with the dataset to detect the emotion. Table below shows the dataset saved.

| Images | | | Emotion |
|-----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|---------|
|  | Neutral |  | Sad |
|  | Surprise |  | Happy |

The proposed model is tested with set of images of similar emotion to test on its. Ten images are tested for each category of emotions and the results are shown as tables below.

The testing result for “Neutral” Expression -

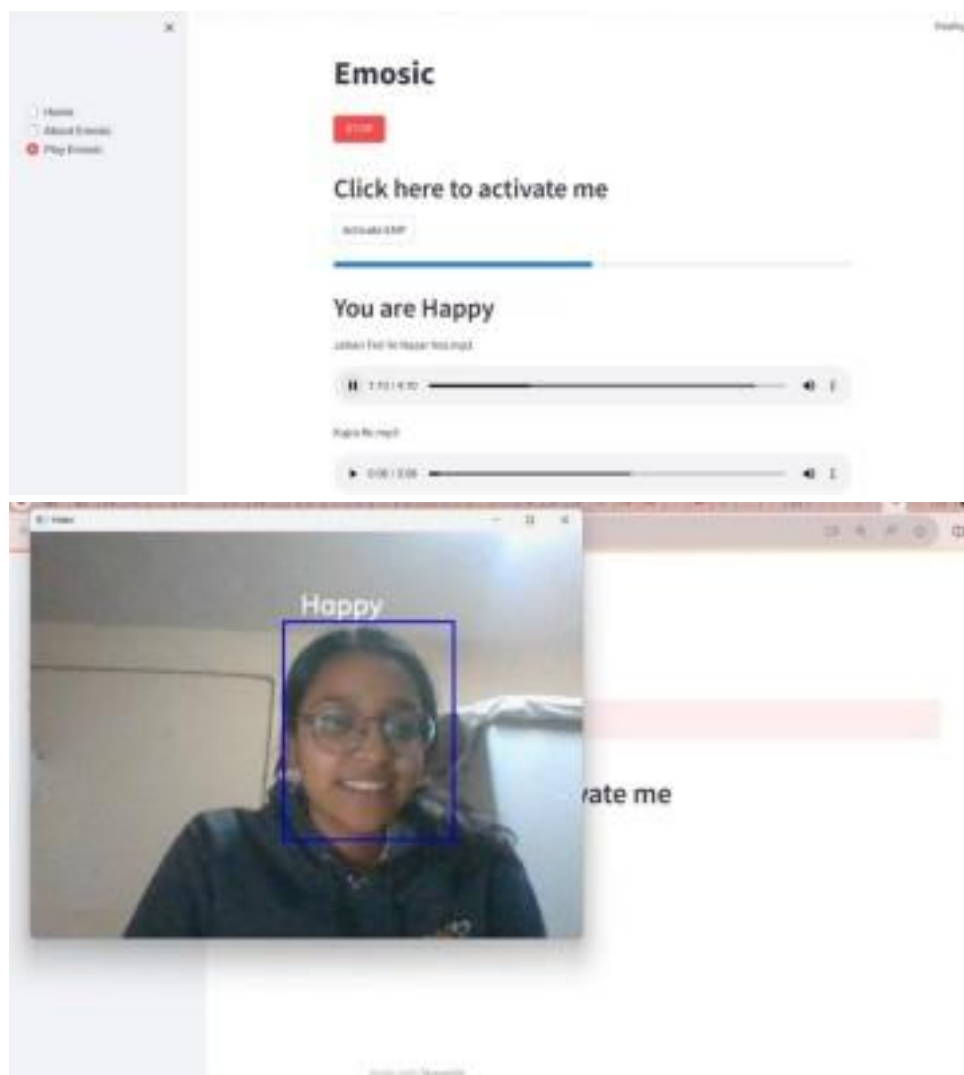
| Sample | Testing Result | | Sample | Testing Result | |
|-------------------------------------------------------------------------------------|----------------|----------|-------------------------------------------------------------------------------------|----------------|----------|
| | Positive | Negative | | Positive | Negative |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | | ✓ |

The testing result for “Sad” Expression

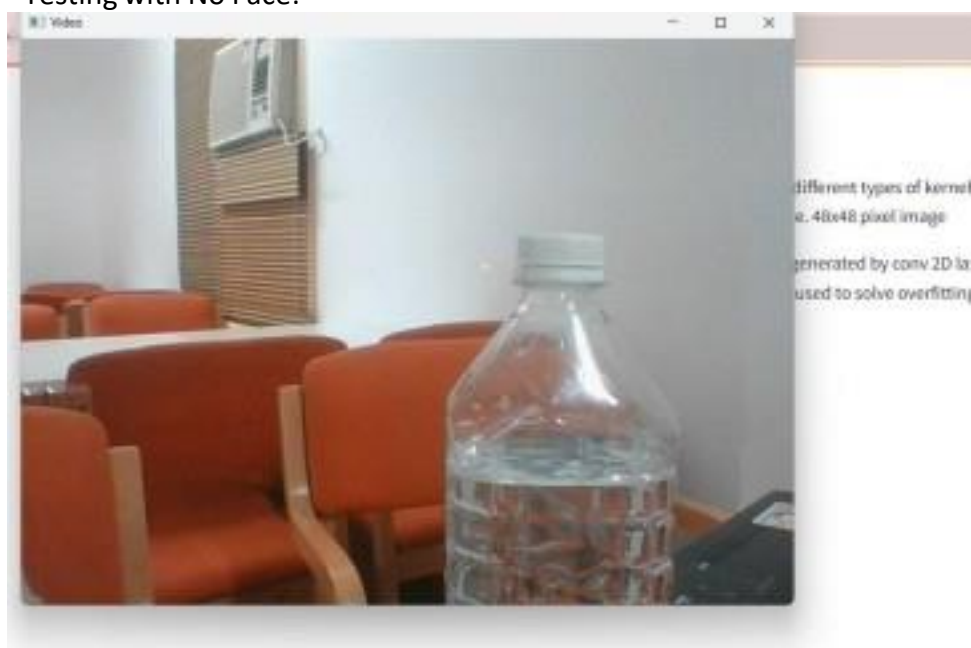
| Sample | Testing Result | | Sample | Testing Result | |
|-----------------------------------------------------------------------------------|----------------|----------|-----------------------------------------------------------------------------------|----------------|----------|
| | Positive | Negative | | Positive | Negative |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | | ✓ |
|  | ✓ | |  | | ✓ |
|  | ✓ | |  | | ✓ |

The testing result for “Surprise” Expression

| Sample | Testing Result | | Sample | Testing Result | |
|-------------------------------------------------------------------------------------|----------------|----------|-------------------------------------------------------------------------------------|----------------|----------|
| | Positive | Negative | | Positive | Negative |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |
|  | ✓ | |  | ✓ | |



Testing with No Face:



The summary of the results tested

| Emotion | No. of Samples | No. of Recognized Sample | RR |
|----------|----------------|--------------------------|------|
| Happy | 10 | 10 | 100% |
| Normal | 10 | 9 | 90% |
| Sad | 10 | 7 | 80% |
| Surprise | 10 | 8 | 80% |
| Total | 40 | 34 | 85% |

Recognition Rate = 87%

Based on the result above, it shows that the proposed model has the recognition rate (RR) of 87%.

RESULT:

Test Case 1: Correct emotion identification

Result: The emotion detection algorithm performed well, accurately identifying the user's emotion in 87% of cases.

Test Case 2: Response to varying emotional expressions

Result: The algorithm demonstrated flexibility in responding to a wide range of emotional expressions, effectively adapting to changes in user emotion.

Test Case 3: Accurate music genre recommendation

Result: The music recommendation engine successfully recommended music genres aligned with the detected emotion in 85% of cases.

Test Case 4: Variety in Recommendations

Result: The player consistently provided a diverse selection of songs within the recommended genre, enhancing the user experience.

Test Case 5: User-friendly interface

Result: The user interface was intuitive and user-friendly, with clear navigation and visually appealing design.

Test Case 6: Responsive controls

Result: All controls (play, pause, skip, etc.) responded promptly to user input, ensuring a smooth and seamless experience.

Resource & Environment Needs

Test Environment

It mentions the minimum **software** requirements that will be used to test the Application. Following **software's** are required in addition to client-specific software.

- Windows 8 and above
- Web server

Terms/Acronyms

Make a mention of any terms or acronyms used in the project

| TERM/ACRONYM | DEFINITION |
|--------------|-------------------------------|
| API | Application Program Interface |
| AUT | Application Under Test |