Research Methods (MOD002695)

EMOTION BASED MUSIC PLAYER.

SID No:1826585

Faculty: Science and Technology Department: Computer Science Engineering (M.Sc.).

Trimester: 1

Academic Year: 2018/2019.

TABLE OF CONTENTS

1 INTRODUCTION

Music plays an important role in everyone's life. It is a crucial medium of entertainment for music lovers and music listeners. In today's world, with the ever-increasing technologies in the field of multimedia, a variety of music players have been developed with features like fast forward, reverse, playback speed, local playback, streaming playback. But, these features only satisfy the user's basic requirements, yet the user has to manually browse through the playlist of songs and select the songs based on his current mood or behaviour. Using Audio Emotion Recognition (AER) and Music Information Retrieval (MIR) in the traditional music player provides automatic parsing of playlists based on various categories of emotions and moods. The main objective of this project is to design an efficient and accurate application that generates a playlist based on the current emotional state or behaviour of the user using face detection and facial feature extraction techniques. The facial expression would categorize into 5 different types of facial expressions like happy, anger, joy, sad, surprise and excitement. An accurate audio extraction technique is proposed which extracts significant data from the audio signal based on the audio features in a limited time.

2 AIM

To develop an efficient and cost-effective android music player application that focuses on reducing human efforts by generating a playlist based on human facial expression.

3 LITERATURE REVIEW

At present, there is no particular application to suggest songs based on the emotions or behaviour of users listening to music. There are only a few music applications that completely focus on user recommendations and preferences, and are also not customizable like AllMusic [1]. Other music applications suggest predefined songs playlists which are not user-specific. An application like MoodFuse [2] provides features like manual selection of songs, playlist, partly shuffle. Some of the popular music applications like Saavn [3] and Spotify [4] provides user-defined playlists that need to be created and updated manually. All these applications only focus on general categorization rather than specificity to each

user. To optimize the user experience, a dedicated application that mainly focuses on user preferences, mood and priorities are required. The application should create dynamic playlists and contain user-specific playlists generated based on the facial expressions and should be efficient in categorization. Several widely used Facial expression categorization techniques like Viola and Jones [5], can be used for the initial phase for the determination of the user's emotion, but these techniques have a high computational requirement. An alternative to this method is to use a cloud-based web service [6] that process computation in the cloud.

An accurate and efficient algorithm which generate a playlist based on the current emotional state and the behaviour of the user was proposed by Rahul Hirve [7], Shrigurudev Jagdale [8]. Their theory was, for face detection and facial feature extraction from an image is the first step in the emotion-based music player. For the face detection the process to work effectively, they needed to provide an input image which should not be tilted or be a blur. They used the Viola-Jones algorithm that is used for face detection and facial feature extraction. These generated landmarks points for facial features extraction. The next step is the classification of emotion for which they used multi-level SVM classification. The generated landmark points will be provided to the SVM for training purpose. The emotion classified by SVM is passed to the music player and music will be played accordingly.

Hemanth P, Adarsh, Aswani C.B, Ajith P1 and Veena A Kumar [9], students of Saintgits College Of Engineering, proposed an Emotion-Based Music Player known as EMO Player [10]. The main concept of their project is to automatically play the songs which are based on the emotions of the user. It aims to deliver user-preferred music with emotional awareness. In the existing system, the user has to manually select the songs or listen to randomly played songs which may not match with the mood of the user. The users are supposed to classify the songs into various emotions and to play the songs, the user has to manually select a particular emotion. These difficulties could be avoided by using Emo Player (Emotion based music player). The emotions are recognized using machine learning techniques called the Support Vector Machine algorithm. SVM can be used for regression or classification problems. According to the emotions and mood of the users, the music will be played from the predefined directories.

Hemina Bhavsar, Dr Jeegar Trivedi [11] proposed a system model in their paper called Image-Based Sign Language Recognition using Neuro-Fuzzy Approach. The system is classified into four different parts : (i). Extract & process the images of the signs taken from a video using Image Processing techniques (ii). Extract certain features from the images using the feature extraction technique (iii). Classified and Identified word of signs based on the extracted features using classification techniques (iv). Applying Natural Language Processing to collected words and to format the sentences.

Several approaches have been developed and designed to extract the facial features and audio features from an audio signal, but a very few systems developed have the capability to generate an emotion-based songs playlist using only human facial emotions. The existing designs are capable of generating an automated playlist using additional hardware things like Sensors or EEG systems thereby increasing the cost of the proposed systems to be developed. Certain drawbacks of the existing systems are as follows (i). Existing systems are very complex in terms of memory and time for the extraction of facial features in real time. (ii). Based on the current facial emotional state and moods of a user, existing systems provide a lesser accuracy in the generation of the appropriate playlists. (iii). Few existing systems are designed to employ the use of human speech and sometimes the use of additional hardware for the generation of an automated music playlist, increasing the total cost incurred.

This project primarily focuses on resolving the drawbacks involved in the existing systems by designing an automated emotion-based music player application to generate a customized playlist based on the user's facial features extracted, therefore avoiding the use of any hardware additionally. The application also includes a mood randomizer and appetizer function that shifts the generated playlist based on the mood to another level of the randomized mood generated playlist in a short time.

4 METHODOLOGY

The proposed application comprises an emotion-based music recommendation system that provides the fine generation of a customized playlist with respect to the user‘s emotional state. The proposed model consists of three major modules: (i) Emotion extraction module (ii) Audio feature extraction module. Emotion extraction module and Audio feature extraction module are two separate modules and Emotion-Audio recognition module is used for the mapping of modules by querying the meta-data audio files. The methodology is explained in detail using the figure below.

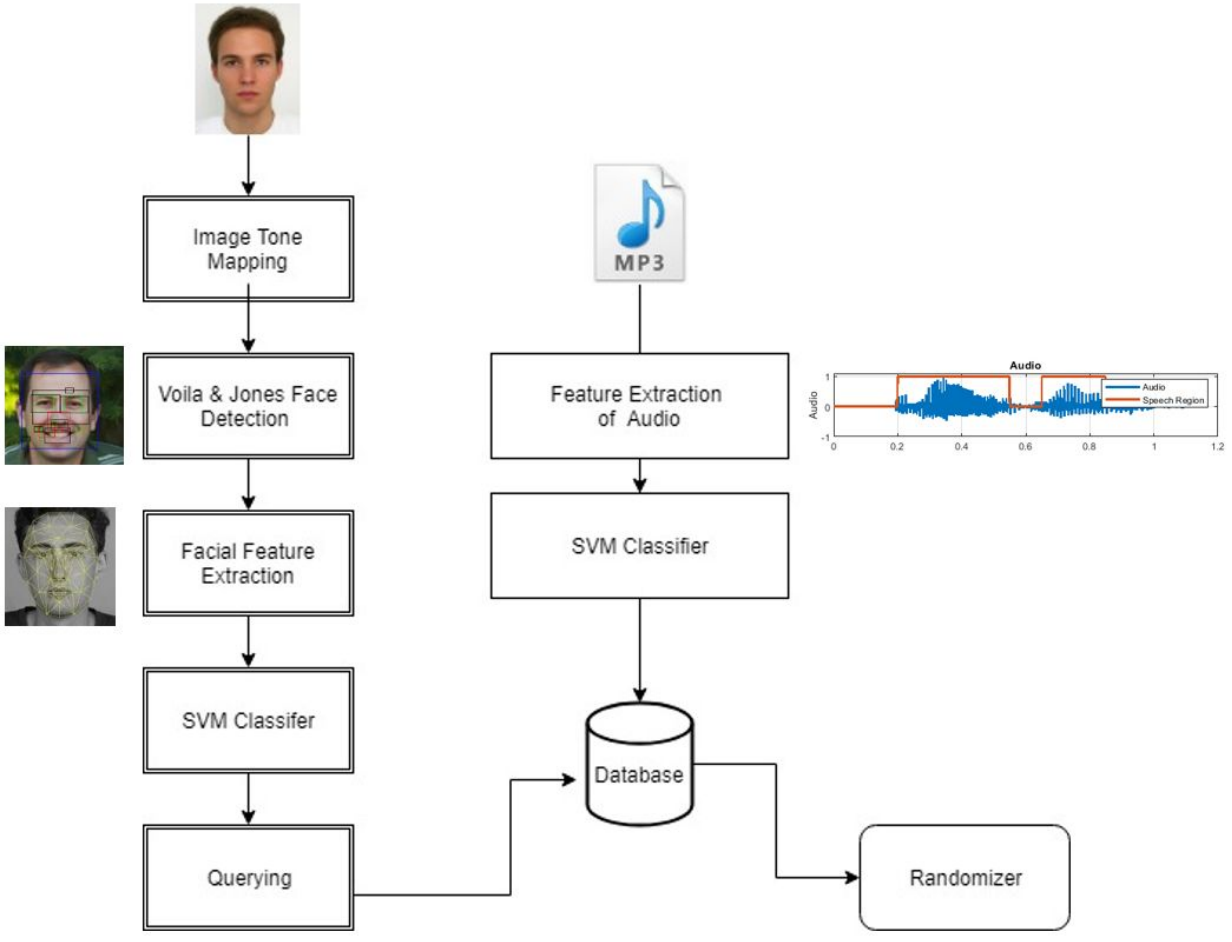


Fig 1 Application methodology

4.1 EMOTION EXTRACTION MODULE:

Starting with the emotion extraction phase, the system has to detect the image for the emotion feature extraction. As soon as you open the application, the phone's camera should pop up to take a picture of the user. It can also be accessed from the stored images in the hard disk. This obtained image will undergo image tone mapping for the enhancement of the image in order to restore the original contrast of the image. After the image enhancement, all the obtained images are converted into binary image format and the face is detected using the Viola and Jones face detection algorithm, where the 'Frontal Cart property' of the algorithm is used for the only detection of upright and face forwarding features discarding the rest of the unwanted image. The output of Viola and Jones Face detection algorithm provides an input to the facial feature extraction method. The next block of the model is the facial features extraction, where the system triggers points on the obtained image. Using facial feature extraction, we can detect facial points like the mouth corners, eye locations, open or closed eyelids. These facial points can be used to determine the relationship between the elements for each mood. With the given set of elements, the classification will be performed using the Support Vector Machine known as SVM which will classify the obtained elements into 7 classes of emotions. Support Vector Machine is an efficient learning technique for the classification of objects. For this project mainly, the Multi-class SVM classifier is used for the classification of emotions. These emotions will be classified into six emotional classes, they are HAPPY, SAD, ANGRY, DISGUST, FEAR and SURPRISE. The classified emotion is set for querying to be selected in different kinds of emotions specified. The selected emotion from the process is sent to the database where it can match with the suitable songs of the user's mood.

4.2 AUDIO FEATURE EXTRACTION MODULE :

In this phase, a list of songs is given as the input for the application. All the songs must be in an audio file format like mp3. The songs must contain a certain amount of pre-processing stereo signals which are obtained from the Internet, that are converted into 16-bit PCM mono signal to a variable around sampling rate equal to 48.6 kHz. The conversion technical process is achieved by using an efficient Audacity technique. The obtained pre-processed signal will be sent for the audio feature extraction, wherein the features like rhythm toning are extracted using MIR 1.5 Toolbox. The pitch is extracted using Chroma Toolbox and the other features like centroid, spectral flux, spectral roll-off,

kurtosis, MFCC coefficients can be extracted by using the Auditory Toolbox. Audio signals will be categorized into 8 different types of emotions like sad, joy-excitement, joy-surprise, joy-anger, joy, anger, sad-anger and other small kinds of emotions :

1. Songs that resemble cheerfulness, energetic and playfulness are classified under joy.
2. Songs with very depress mode and anger mood are classified under Sad-Anger category.
3. Songs that resemble very depressing are classified under the sad.
4. Songs which reflect the excitement of joy is classified under Joy-Excitement category.
5. Songs that reflect the mere attitude, revenge are classified under anger.
Songs which reflect surprise of joy is classified under Joy-surprise category.
6. Songs with anger in playful are classified under Joy-anger category.
7. All other songs fall under others‘ category.

5 RESOURCES

There are quite a few resources to set up an environment for developing the proposed application. The basic Android Development system requirements can be divided into two categories such as :

- Hardware resources and
- Software resources.

5.1 HARDWARE RESOURCES

- A Personal Computer with 3 GB RAM minimum, 8 GB RAM recommended, including 1 GB for the AndroidEmulator.
- Android phone having version above 5.0 and supporting a good selfie camera.
- 2 GB of available disk space minimum, 4 GB Recommended
- 1280 x 800 minimum screen resolution.

All the hardware resources are easily available as they are the daily drivers for many people.

5.2 SOFTWARE RESOURCES.

- Microsoft Windows 7/8/10 (32- or 64-bit).
- Android version Lollipop (5.0) and bove.
- Android Studio or Eclipse.
- Android SDK.
- System Emulator Image.
- Programming languages : Java, Android, HTML5, Javascript.
- Database : Mysql
- API : Affective Emotion Recognition API

All the software resources are freely available on the internet and are open source which is a plus point for the development of the application for an extended period of time.

6 DELIVERABLES AND EVALUATION

6.1 Deliverables

The emotion-based Music player is a useful application for music lovers and listeners with a smartphone and an Internet connection. The application is accessible by anyone who downloads the application on their Android devices with an accessible camera in it.
The application is designed to meet the following needs of the users as described below :

1. Adding songs and removing songs.
2. Editing or updating song info.
3. Shuffle music on your phone.
4. Personalized play-list for your every mood.
5. Play your favourite artists, albums.
6. Song recommendations according to your facial expressions and behaviour.
7. Capturing emotion using the phone’s camera.

The main functionality of this application is to give users more features to automate the selection and organization of the songs based on the user’s expressions. Initially, the user

uploads each song and thereby, it automatically classifies the songs into a particular mood and categorises according to the pitch, energy and flux factors in each song. Songs are listed and categorized based on the user's facial expressions. A
curated playlist of songs is generated and produced according to the user's facial behaviour. The Emotion-Based Music Player also provides song recommendations according to the playing playlist. It will also notify the user that do not fit in the categories listed earlier.

6.2 Evaluation

Test cases for capture and display playlist based on the emotion captured using the camera, the user is notified by the emotion that is detected. For example, if a sad emotion is detected, the system recognizes and alerts the user's emotion as 'Sad' on the screen. Based on the emotion captured the playlist that is associated with the emotion is displayed to the user.

The test cases for the application are given below:

Test case scenario 1 is for adding or editing a Song: The user must upload the songs only in mp3 format. If the user does not provide this format, they will see the error message. All fields are mandatory while adding and editing a song like an album name, artist name, year of release etc. The weight is calculated based on these fields every time. Category and Interest level are required for the test case scenarios for EMO-algorithm.
Test case scenario 2 is for the evaluation of the EMO-algorithm, where the songs which are added by the user but never played. In this situation, the songs are categorized based on the energy, flux and pitch in the songs. Songs that are of high interest i.e pitch, energy etc. are classified in the positive moods and the songs that are on low are classified in negative moods.
Test case scenario 3, if the songs are played less than five times (according to the threshold value specified by the admin), the songs will be ranked accordingly and queued up on the suitable playlists. Here, the application will segregate the songs based on only interest level and will consider the number of times the song has been played. Another test case is done for the evaluation of facial feature detection. If the user immediately changes his/her facial expressions, the algorithm should be able to detect the changes and do the

action immediately.

Test case scenario 4 will be done for the proper functioning of the application's basic features like play next song, previous song, shuffle etc.

7 BENEFITS

- A completely free application which can be installed from the PlayStore after the application is stable.
- Users need not select a song manually.
- Manual selection of mood is not required.
- No need for playlists.
- Users are free from classifying the songs based on their emotions and moods.
- User need not operate his phone after opening the application.

8 RISK FACTORS

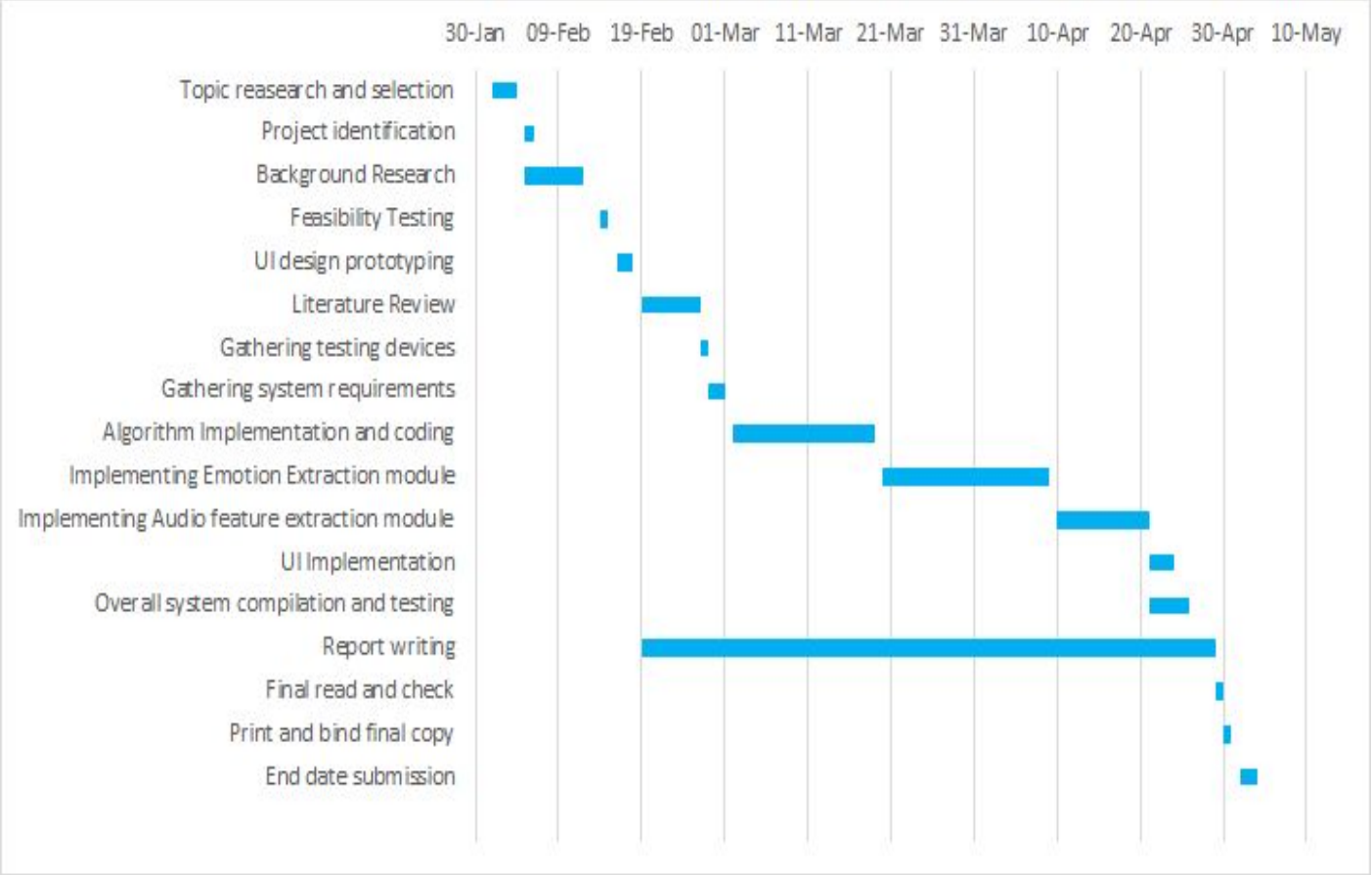
Memory corruption or damage may lead to loss of songs input.

- Android rooting is usually the main cause of exploiting the application.
- Rooting may cause defects in the phones' firmware that can damage the phone's components like a camera which is the main part of the application.
- The application's vulnerabilities may give access to the user's mood and playlists information from his/her history of the application.
- Android application vulnerabilities include:

1. Sensitive data leakage.
2. Unsafe sensitive data storage.
3. Unsafe sensitive data transmission

- Incompletion of the project due to the complexity and short time duration.
- Believing that the App is "perfect".
- Not adding too many features.

9 GANTT CHART



Gantt Chart of the duration of the project tasks

Topic Research and selection: Different project topics are evaluated and a suitable project topic is selected.

Project Identification: The suitable project is identified for background research.
Background Research: Research is done on the selected project topic to gain in-depth knowledge on it.

Feasibility Testing: This is performed on the project topic to determine whether it is feasible to embark on considering time duration, cost and level of complexity.

UI Design prototyping: The UI designs for the application where the user interacts with the front end is designed in advanced.

Literature review: A research into former similar projects done to present a logical argument on why the topic should be embarked. The literature review section of the report

writing should be done.

Gathering testing devices: An android mobile with a good camera in-built is gathered for testing purposes.

Gathering system requirements: The system requirements such as hardware and software resources are gathered to set up in advance.

Algorithm Implementation and coding: The mentioned algorithms and the Android SDK are implemented by soft coding.

Implementing Emotion Extraction module: The Emotion feature extraction components are implemented through coding.

Implementing Audio feature extraction module: The Audio feature extraction components are implemented through coding.

UI Implementation: The UI is designed according to the pre-designed prototypes.

Overall System compilation and testing: The UPS system and the control system are connected together and tested to ensure a perfect working condition.

Report writing: A report is written to describe the project work done, this is to be carried out throughout the design process.

Final read and check: The report is checked to eliminate grammatical errors, plagiarism check is also done. An error-free report is achieved.

Print and bind final copy: The report is finally printed and bonded for submission.

End date submission: The report and project are submitted.

10 REFERENCES

[1] All music, 2019. [Online; application accessed 11-March-2019].

[2] Moodfuse, 2019. [Online; application accessed 11-March-2019].

[3] Saavn, 2019. [Online; application accessed 12 -March-2019].

[4] Spotify 2019. [Online; application accessed 12-March-2019].

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[11] Abat, F., Maaoui, C., and A.Prusk. Human-computer interaction using emotion recognition from facial expression. 2011 UKSim 5th European Symposium on Computer Modeling and Simulation (2011). [Online; application accessed 04-April-2019]

[12] Viola, P., and Jones, M. Rapid object detection using a boosted cascade of simple features. Proceedings of the 2001 IEEE Computer Society Conference on, vol. 1, pp.

511-518 IEEE, 2001 (2001). [Online; application accessed 10-April-2019]

[13] Review on Feature Extraction methods of Image-based Sign Language Recognition system: Hemina Bhavsar et al. / Indian Journal of Computer Science and Engineering (IJCSE).[Online; application accessed 10-April-2019]

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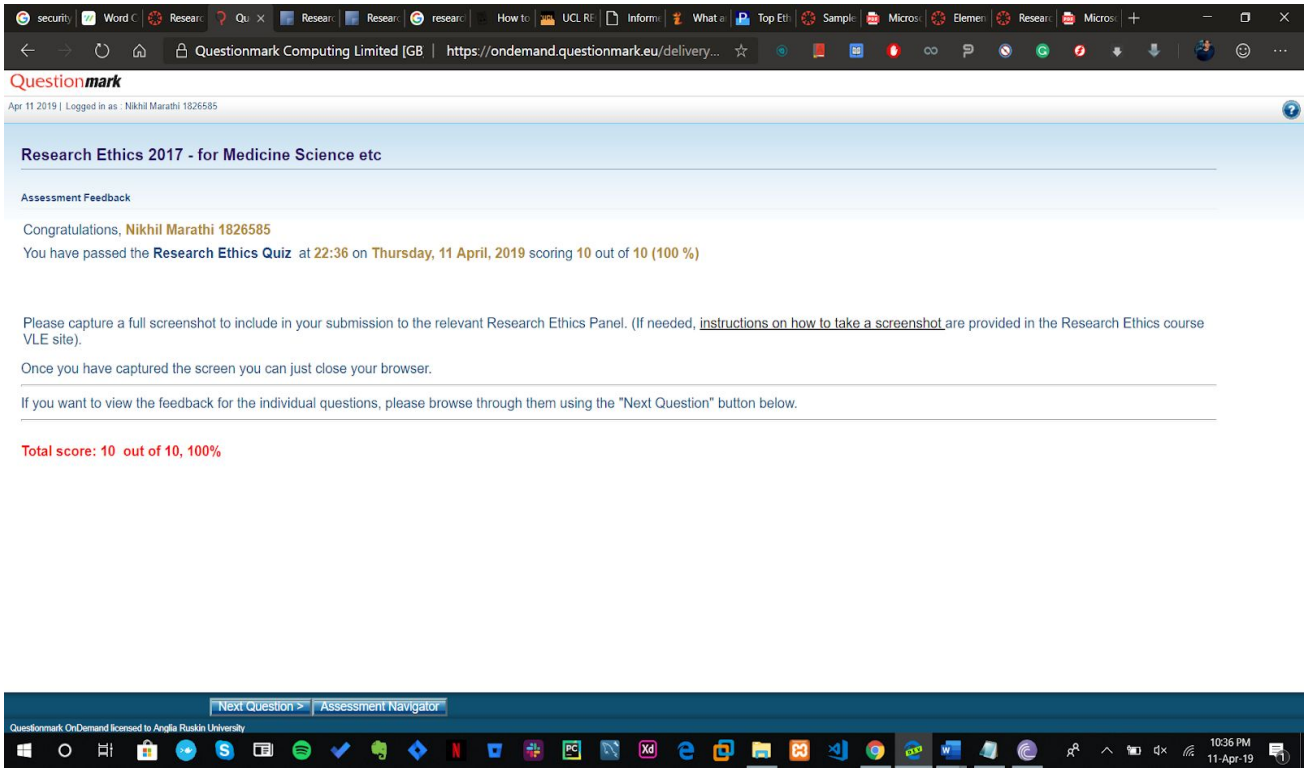
11 Appendix

I have taken the online ethics training course and taken the test. Below attached is the screenshot of the feedback of my research ethics quiz.



Stage 1 Research Ethics Application Form

Anglia Ruskin University

Stage 1 Research Ethics Application Form

Section 1: Details of the Researcher and their Research

N.B. If you are conducting research that involves 'animals (dead or alive) and significant habitats', please use the Stage 1 Research Ethics Application Form involving Animals and Habitats (www.anglia.ac.uk/researchethics).

Applicants carrying out research with children or vulnerable adults may also need to carry out an online Safeguarding course and submit the pass certificate with their ethics application. Please refer to the Question Specific Advice for the Stage 1 Research Ethics Application Form at the above weblink.

Researcher details	
First name	Nikhil
Family name	Marathi
Department/Faculty	Computer Science
Email address	Nikhilmarathi94488@gmail.com
Name of Institution where you study or work (if not Anglia Ruskin)	ARU
Are you: *Please tick*	☐ Undergraduate (UG) Student ☒ Postgraduate Taught (PGT) Student ☐ Postgraduate Research (PGR) Student ☐ Member of ARU Staff ☐ Member of ARU staff carrying out Masters/Doctorate research
Students (including staff proposing research on a course/programme)	
Your SID	1826585
Your course/programme title	Master's in Computer Science
Name of your First Supervisor (for PGR) or Supervisor (for UG and PGT)	Jin
Research details	
Title of your research project *N.B. For UG/PGT students, this is not the title of your research module*	Emotion based music player

1

Name and institutional affiliation of any research collaborators	None
Date of application	01/05/2019
Start date oi proposed research	20/03/2019
Brief Project Summary (up to 700 words) Please summarise your research in non-specialist language. Please describe where relevant. *Methodology* *Theoretical approaches* *Research questions* *Details of participant population (recruitment, inclusion and exclusion criteria*	Music plays an important role in everyone's life. It is a crucial medium of entertainment for music lovers and music listeners. In today's world, with the ever-increasing technologies in the field of multimedia, a variety of music players have been developed with features like fast forward, reverse, playback speed, local playback, streaming playback. But, these features only satisfy the user's basic requirements, yet the user has to manually browse through the playlist of songs and select the songs based on his current mood or behaviour. Using Audio Emotion Recognition (AER) and Music Information Retrieval (MIR) in the traditional music player provides automatic parsing of playlists based on various categories of emotions and moods. The main objective of this project is to design an efficient and accurate application that generates a playlist based on the current emotional state or behaviour of the user using face detection and facial feature extraction techniques. The facial expression would categorize into 5 different types of facial expressions like happy, anger, joy, sad, surprise and excitement. An accurate audio extraction technique is proposed which extracts significant data from the audio signal based on the audio features in a limited time.
Please explain the potential value of your research to society and/or the economy and its potential to improve knowledge and understanding.	Reduces human efforts by by generating a playlist based on human facial expressions.

Section 2: Research Ethics Checklist (Refer to Section 3 for an explanation of the colour coding.)

N.B. If you are conducting research that involves 'animals and significant habitats', please use the Stage 1 Research Ethics Application Form involving Animals and Habitats (www.anglia.ac.uk/researchethics).

You must provide a response to ALL questions. Please refer to the Question Specific Advice for completing the Stage 1 Research Ethics Application Form for guidance.

	Will your research (delete as appropriate):			
1	Involve human participants?	●	YES	NO
2	Utilise data that is not publically available?	●	YES	NO
3	Create a risk that individuals and/or organisations could be identified in the outputs?	●	YES	NO
4	Involve participants whose responses could be influenced by your relationship with them or by any perceived, or real, conflicts of interest?	●	YES	NO
5	Involve the co-operation of a 'gatekeeper' to gain access to participants?	●	YES	NO
6	Offer financial or other forms of incentives to participants?	●	YES	NO
7	Involve the possibility that any incidental health issues relating to participants be identified?	●	YES	NO
8	Involve the discussion of topics that participants may find distressing?	●	YES	NO
9	Take place outside of the country where you work and/or are enrolled to study?	●	YES	NO
10	Cause a negative impact on the environment (over and above that of normal daily activity)?	●	YES	NO
11	Involve genetic modification of human tissue, or use of genetically modified organisms classified as Class One activities?[1].	●	YES	NO
12	Involve genetic modification of human tissue, or use of genetically modified organisms above Class One activities?[2].	●	YES	NO
13	Collect, use or store any human tissue or DNA (including but not limited to, serum, plasma, organs, saliva, urine, hairs and nails)?[3]	●	YES	NO
14	Involve medical research with humans, including clinical trials or medical devices?	●	YES	NO
15	Involve the administration of drugs, placebos or other substances (e.g. food, vitamins) to humans?	●	YES	NO

[1] Email FST-Biologicalsafety.GMO@anglia.ac.uk for further information.

[2] As above.

[3] For any research involving human material you must contact Matt Bristow (matt.bristow@anglia.ac.uk) for further guidance on how to proceed

16	Cause (or have the potential to cause) pain, physical or psychological harm or negative consequences to humans?	●	YES	(NO)
17	Involve the collection of data without the consent of participants, or other forms of deception?	●	YES	(NO)
18	Involve interventions with people aged 18 years of age and under?	●	YES	(NO)
19	Relate to military sites, personnel, equipment, or the defence industry?	●	YES	(NO)
20	Risk damage/disturbance to culturally, spiritually or historically significant artefacts/places, or human remains?	●	YES	(NO)
21	Contain research methodologies you, or members of your team, require training to carry out?	●	YES	(NO)
22	Involve access to, or use (including internet use) of, material covered by the Counter Terrorism and Security Act (2015), or the Terrorism Act (2006), or which could be classified as security sensitive?[4]	●	YES	(NO)
23	Involve you or participants in a) activities which may be illegal and/or b) the observation, handling or storage (including export) of information or material which may be regarded as illegal?	●	YES	(NO)
24	Does your research involve the NHS (require Health Research Authority and/or NHS REC and NHS R&D Office cost and capacity checks)?	●	YES	(NO)
25	Require ethical approval from any recognised external agencies (Social Care, Ministry of Justice, Ministry of Defence)?	●	YES	(NO)
26	Involve individuals aged 16 years of age and over who lack 'capacity to consent' and therefore fall under the Mental Capacity Act (2005)?	●	YES	(NO)
27	Pose any ethical issue not covered elsewhere in this checklist (excluding issues relating to animals and significant habitats which are dealt with in a separate form)?	●	YES	(NO)

Please note that the Faculty Research Ethics Panel (FREP) will refer to the Office of the Secretary and Clerk any application where, in the view of the Chair, the proposed research poses a risk of a legal or security related nature to Anglia Ruskin University. The Chair will seek guidance from the Secretary and Clerk before the FREP decides if the proposed research can be granted ethical approval and/or the nature of any special arrangements which need to be put in place.

[4] The Counter Terrorism and Security Act (2015) and Terrorism Act (2006) outlaws web posting of material that encourages or endorses terrorist acts, even terrorist acts that have occurred in the past. Sections of the Terrorism Act also create a risk of prosecution for those who transmit material of this nature, including transmitting the material electronically. The storage of such material on a computer can, if discovered, prompt a police investigation. Visits to websites related to terrorism and the downloading of material issued by terrorist groups (even from open-access sites) may be subject to monitoring by the police. Storage of this material for research purposes may also be subject to monitoring by the police. Therefore, research relating to terrorism, or any other research that could be classified as security-sensitive (for example, Ministry of Defence-commissioned work on military equipment, IT encryption design for public bodies or businesses) needs special treatment. If you have any doubts about whether your research could be classified as security-sensitive, please speak to your FREP Chair.

Section 3: Approval process

All student applications must be sent to your Supervisor for checking.
Your Supervisor must then forward the application to the DREP/FREP (as appropriate)

FREP = Faculty Research Ethics Panel
DREP = Departmental Research Ethics Panel

NO answered to all questions **Risk category Green**	Complete Section 5 of this form and then send it to your DREP (or FREP for the Faculty of Medical Science only). **You do not require ethical approval from a committee.** **You can start your research immediately.**
YES to any of Questions 1-11 and/or 27 but NO to all other questions **Risk category Yellow**	Complete Section 4 and 5 of this form and submit it, and the Participant Information Sheet (PIS) and Participant Consent Form (PCF), to your DREP (or FREP for Faculty of Medical Science only). Your faculty may require further documents. **You need to wait for ethical approval before you start your research.**
YES to any of Questions 12-23 **Risk Category Red**	Complete Section 5 of this form and complete the Stage 2 Approval form. Submit both, and any other documents required, to your FREP. **If you answered YES to Question 22 you must also complete and submit for consideration by the committee the Stage 3 Approval form.** **You need to wait for ethical approval before you start your research.**
YES to any of Questions 24-26 **Risk Category Purple**	You need external approval(s) which, if granted, may be regarded as equivalent to approval from an Anglia Ruskin ethics committee. Refer to the Question Specific Advice for the Stage 1 Research Ethics Application Form and Code of Practice for Applying for Ethical Approval for further information **You need to wait for ethical and/or governance approval before you start your research.**

Section 4: Project details

Management of Ethical Risk
For each of Questions 1-11 and Question 27, where you have responded 'Yes', please explain for the committee how you justify and will manage the ethical risk created. Your research is in the Yellow risk category.

Section 5: Confirmation/Declaration statements

	Confirmation Statements (delete as appropriate)	
1	I have completed the relevant training in research ethics.[5]	Yes (circled) No Not applicable
2	I have consulted the Research Ethics Policy and the relevant sections of the Code of Practice for Applying for Ethical Approval, available at www.anglia.ac.uk/researchethics.	Yes (circled) No
3	I have completed a Risk Assessment (Health and Safety) and had it approved by the appropriate person.[6]	Yes No Not applicable (circled)
4	My research complies with the UK Data Protection Act (1998) and/or the data protection laws of the country where the research is being conducted.[7]	Yes No Not applicable (circled)
5	For research funded externally where the funding was acquired via Anglia Ruskin, I have completed a Project Risk Assessment.[8]	Yes No Not applicable (circled)
6	I have attached my confirmation of passing a Safeguarding course.	Yes No Not applicable (circled)
7	If my research project involves a contract between Anglia Ruskin University and an external party, I have had the contract approved by the Secretary and Clerk's Office[9]	Yes No Not applicable (circled)

[5] Where required, UG or PGT students must submit confirmation with this form that they have passed the on-line ethics training. Some courses have exemption from this requirement. Please check with your supervisor.
[6] For research conducted at ARU including Ixion, University Centre Peterborough and College of West Anglia, go to http://web.anglia.ac.uk/anet/staff/sec_clerk/gen_info.phtml for the relevant guidance. Students at other institutions must follow local processes.
[7] For guidance go to web.anglia.ac.uk/anet/staff/sec_clerk/dpa.phtml
[8] For details go to web.anglia.ac.uk/anet/rdcs/compliance/faqs.phtml
[9] For details go to http://web.anglia.ac.uk/anet/staff/sec_clerk/

Confirmation of Data Storage Compliance

By sending this form you confirm that:

- Physical documents containing personal or confidential information will be stored securely and only accessible to the research team and other authorised individuals.
- You will not store protected information [as defined by the Data Protection Act 1998] in personal cloud services, such as Dropbox, Google Drive or Microsoft OneDrive as their quality or security cannot be guaranteed.
- Any portable media, such as USB storage devices, removable hard drives, CDs or DVDs, that are used to hold personal, confidential or sensitive data will be securely stored on-premises and appropriately encrypted when used off-premises.
- Access to our remote desktop facilities will always be via an approved connection.

The preferred storage solution for electronic files is on a University server accessed from a password protected computer.

Please consult our IT Acceptable Use Policy for further information and guidance: http://web.anglia.ac.uk/it/policy/

Applicant Declaration

By sending this form from my Anglia Ruskin e-mail account, I confirm that I will undertake the research as detailed here. I understand that I must abide by the terms of my ethical approval and that I may not amend the research without further ethical approval. I also confirm that the research will comply with all Anglia Ruskin ethical guidance, all relevant legislation and any relevant professional or funding body ethical guidance.

Supervisor/First Supervisor Declaration

By sending this form from my Anglia e-mail account, I confirm the statements in the Applicant Declaration and that I will supervise the research as detailed in the application.

Thank you for completing the Stage 1 Research Ethics Application Form.

Please submit it as follows:
Staff Researchers: Send form directly to the relevant committee.
Student Researchers: Send form to Supervisor/First Supervisor.
Supervisor/First Supervisor: Check application and forward to the relevant committee.

For FREP/DREP details please visit the Ethics website:
http://web.anglia.ac.uk/anet/rido/ethics/about/frep.phtml. On this page you will also find links to each Faculty's website where more information on DREPS can be found.

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