 title

 problem statement/gap in existing provision

 objectives

 methods

 timetable

 resources to be used

 any ethical considerations (please read the [further information](https://warwick.ac.uk/fac/sci/dcs/teaching/material/cs310/components/specification/discussion) on this)

**A mobile application for democratic music playback with a neural network suggestion system.**

Problem Statement

Generally, in places such as a gym, a party or a car, the music being played is controlled by one person or device, the “host”. This mobile application aims to replace this idea with that of a collaborative democratic music playback environment where each user has the ability to make their voice heard. Users will be able to vote for the next song, rate the current song and request to change the volume. While the song that is voted next is likely to be known by a large portion of the lobby, there will still be users who are unfamiliar with the democratically elected song. Therefore, the app will provide on-screen lyrics in time with playback. With these functionalities it is important to let the users in a lobby communicate, therefore each user will have the ability to enter a chat room. In an attempt to prevent users from abusing their voting powers, a vote-weighting system will be implemented so that users who have their recommendations downvoted by a certain percentage will have their vote worth less across all future lobbies. On the contrary, if their suggestions are perceived by other users to be particularly good, then their vote will become worth more.

In the event that no song has been decided as the next song, the obvious option would be to shuffle the playlist to find a pseudo-randomly generated song. The whole purpose of the app is to provide music playback with a high probability that the majority of users will enjoy. Therefore, the application will make use of a neural network to determine the next song in the queue if the vote results in a draw or there are insufficient votes. The inputs for this neural network will stem mainly from user’s most played tracks (if data is available) and the genres/songs most voted for in the past. Feedback will be provided to the network via the ratings of the songs suggested by the neural recommendation system.

The host device will be the one controlling the lobby settings, who is allowed to join the lobby, etc. Instead of having to manually enter a lobby key, host devices can send a deep-link to join the lobby or generate a QR Code.

Objectives:

1. Host:
   1. The host user will be able to create a lobby and invite users to this lobby either through a key, a link, or a QR code.
   2. The host user will be able to alter the following lobby settings before and after creation:
      1. Lobby name
      2. Base playlist
      3. Suggestion mode (in-order, shuffle, neural)
      4. Maximum users
      5. Type of lobby (gym, party, car, etc.)
      6. Chat room (enabled/disabled)
      7. Volume Control (enabled/disabled)
      8. Lyrics (enabled/disabled)
   3. The host user will be able to terminate their lobby at any time.
   4. The host user will be able to override the decisions made by the other lobby members, and the whole lobby will be notified.
   5. The host user will be able to authenticate their account with the streaming service of their choice.
2. User:
   1. Users will be able to join a lobby if they enter the correct key given it is not full.
   2. Users will not be able to join a lobby that is full.
   3. Users can only be in 1 lobby at a time.
   4. Users can leave a lobby at any time.
   5. Users can choose to show or hide the lobby chat room if enabled.
   6. Users can choose to show or hide the song lyrics if enabled.
   7. Users can thumbs-up or thumbs-down the current song
   8. Each user has 1 vote for the next song (however, their vote may be worth more or less than 1).
   9. A user’s vote weight depends on the number of times they have received a significant number of thumbs-up or thumbs-down for a suggestion.
   10. A user cannot receive a vote weight of 0.
   11. If the lobby settings allow it, users can vote to turn the volume up or down.
   12. The user can save any song being played to their library of the streaming service of their choice (provided it is supported by the app).
   13. Users from both Android and iOS platforms can download and use the app.
3. Miscellaneous:
   1. The backend API must run efficiently in order to be scalable, and therefore multithreading may need to be implemented.