DJ BOX

Automatic playlist generation

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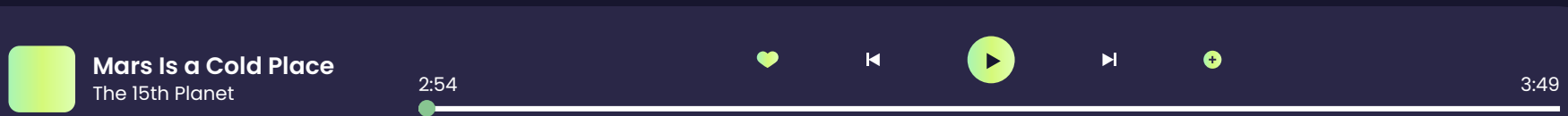

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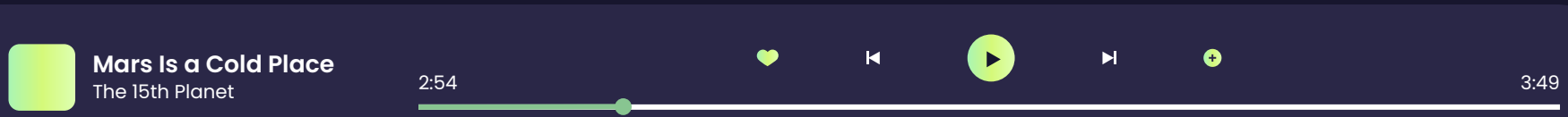
Motivation & Goal



01 Motivation

Background music is crucial for setting the right atmosphere in various situations

Manually creating playlists

time-consuming, and may not fit the desired ambiance

Pre-existing playlist

standardized and may not cater to individual needs

01 Goal

Personalization

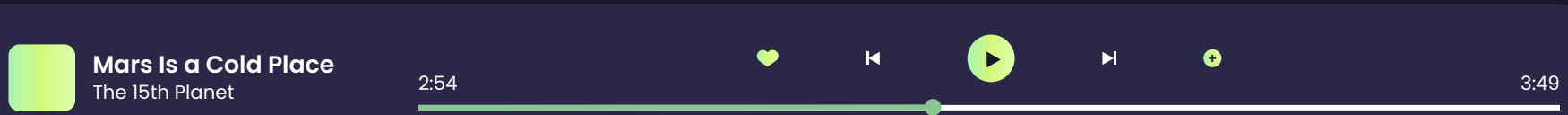
Input specific occasion,
mood, duration

Generation

Customized playlist
suited to conditions

02

Similar apps

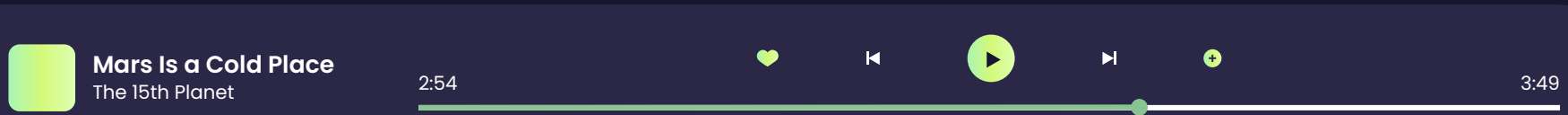


02 Similar apps

	Youtube	Apple music	Spotify
Common function	**推送歌單、歌單搜尋、曲風篩選、歌單分享**		
preference	• 音訊和MV切換 • 音樂收錄範圍廣	• 智慧播放清單 • 接力播放 • 多樣化播放清單	• 推薦機制 • 共享合輯 • annual wrapped
difference	無法客製化長度、歌單中的曲目無法篩選		

03

App user interface & function



03 Function

選擇情緒

根據使用者的情緒
選擇歌單

選擇場合

根據使用者應用的
場合選擇歌單

選擇時長

根據使用者需要的
時長選擇歌單

Youtube播放

可以在 Youtube上播放
DJ Box 生成的歌單

智能歌單

根據使用者提供的條件
推送最合適的歌單

個人歌單

可以將喜歡的歌單收藏
至個人歌單中

01 DJ Box 介紹

選擇音樂風格

根據使用者喜好、需要場合等推薦適合歌單

智能歌單

根據使用者提供的條件推送最合適的歌單

替換歌曲

若使用者不滿歌單中的曲目可要求系統替換

跨平台播放

可以在 Youtube上播放 DJ Box 生成的歌單

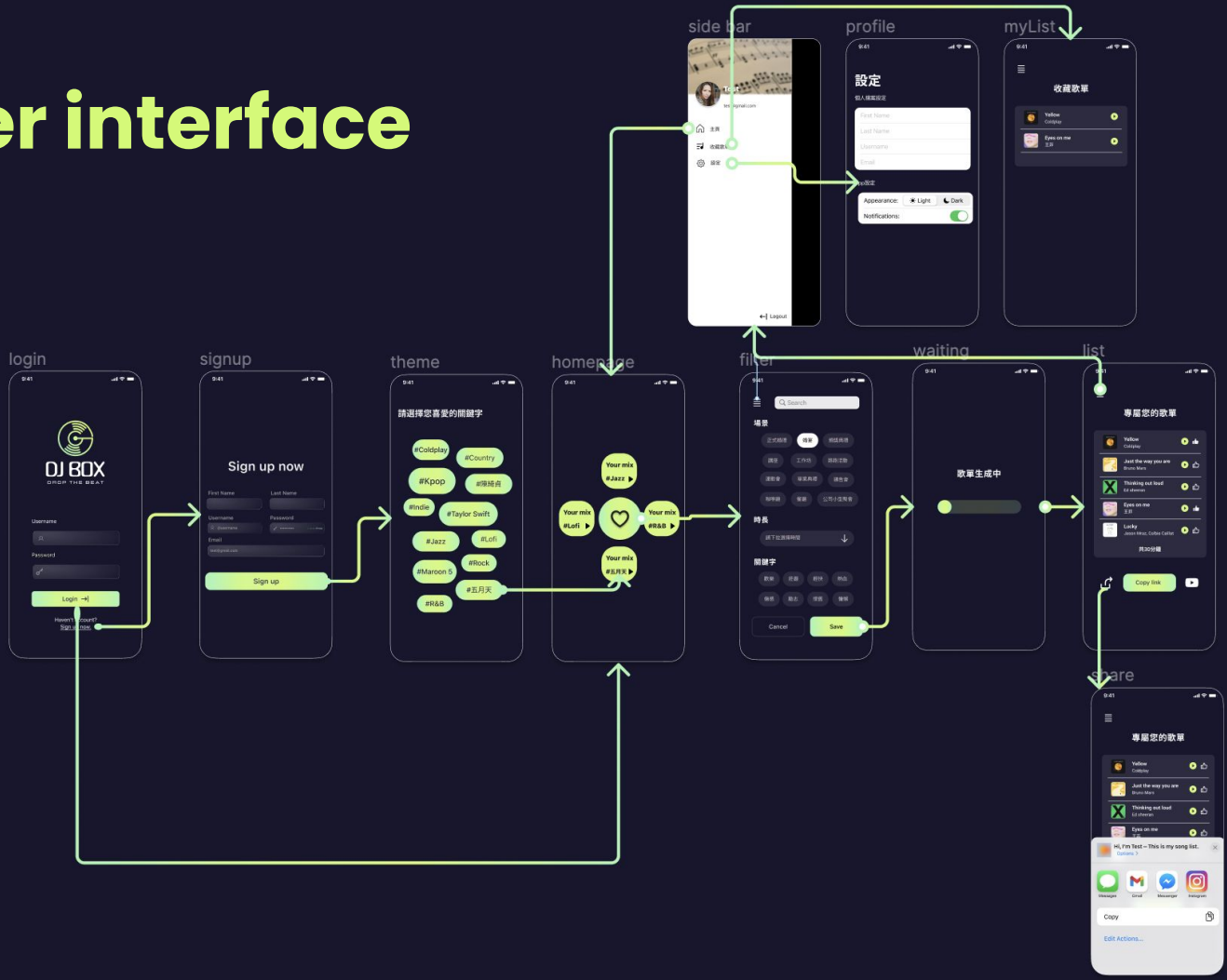
分享歌單

可以將歌單分享給其他使用者

個人歌單

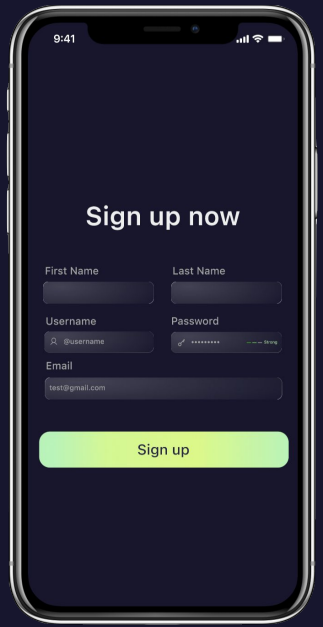
可以將喜歡的歌單或歌曲收藏至個人歌單中

03 App user interface

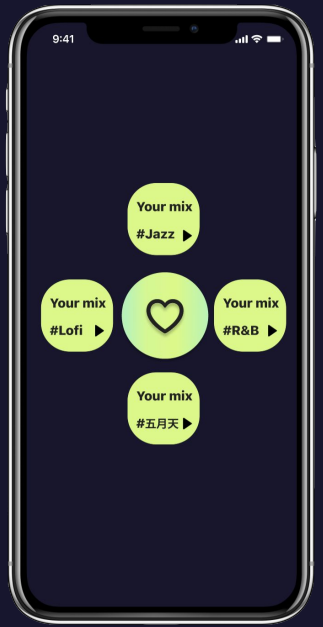


03 DJ Box 雛形


9:41
DJ BOX
DROP THE BEAT
Username
Password
Login
Haven't account?
Sign up now.


9:41
Sign up now
First Name
Last Name
Username
Password
@username
Email
test@gmail.com
Sign up

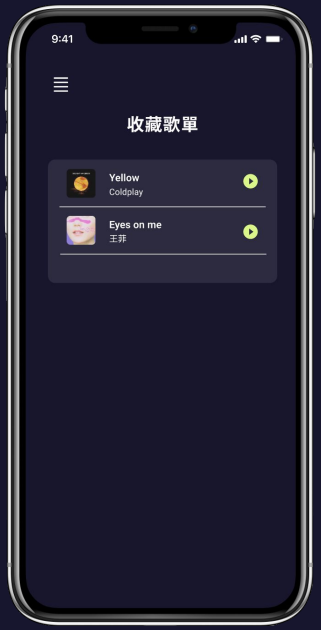

9:41
請選擇您喜愛的關鍵字
#Coldplay
#Country
#Kpop
#五月天
#Indie
#Taylor Swift
#Jazz
#Lofi
#Maroon 5
#Rock
#陳綺貞
#R&B


9:41
Your mix
#Jazz
Your mix
#Lofi
Your mix
#R&B
Your mix
#五月天

03 DJ Box 雛形

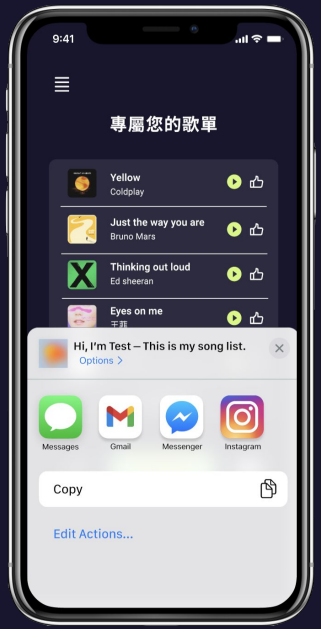

9:41
Search
場景
正式婚禮
婚宴
頒獎典禮
講座
工作坊
路跑活動
運動會
畢業典禮
禱告會
咖啡廳
餐廳
公司小型聚會
時長
請下拉選擇時間
關鍵字
歡樂
莊嚴
輕快
熱血
傷感
勵志
懷舊
慵懶
Cancel
Save

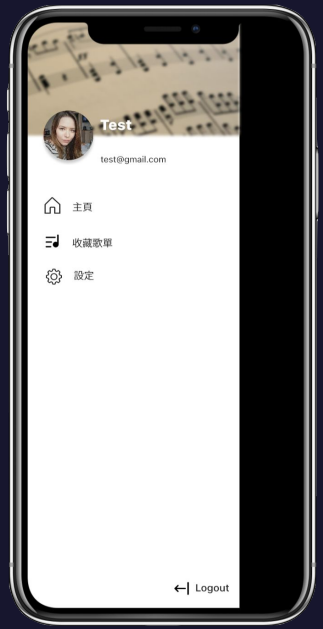

9:41
歌單生成中

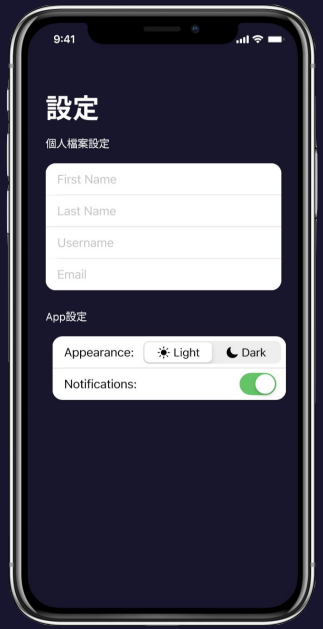

9:41
收藏歌單
Yellow
Coldplay
Eyes on me
王菲


9:41
專屬您的歌單
Yellow
Coldplay
Just the way you are
Bruno Mars
Thinking out loud
Ed sheeran
Eyes on me
王菲
Lucky
Jason Mraz, Colbie Caillat
共30分鐘
Copy link

03 DJ Box 雛形

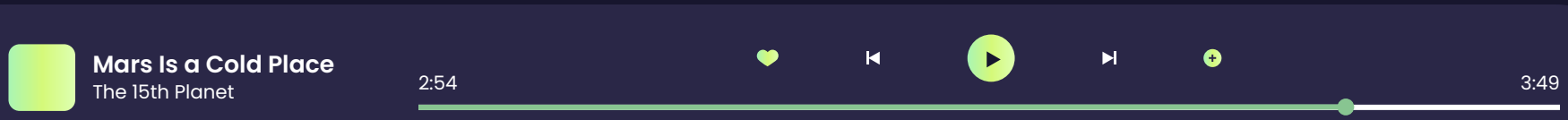

9:41
專屬您的歌單
Yellow
Coldplay
Just the way you are
Bruno Mars
Thinking out loud
Ed sheeran
Eyes on me
Hi, I'm Test – This is my song list.
Options
Messages
Gmail
Messenger
Instagram
Copy
Edit Actions...


Test
test@gmail.com
主頁
收藏歌單
設定
Logout

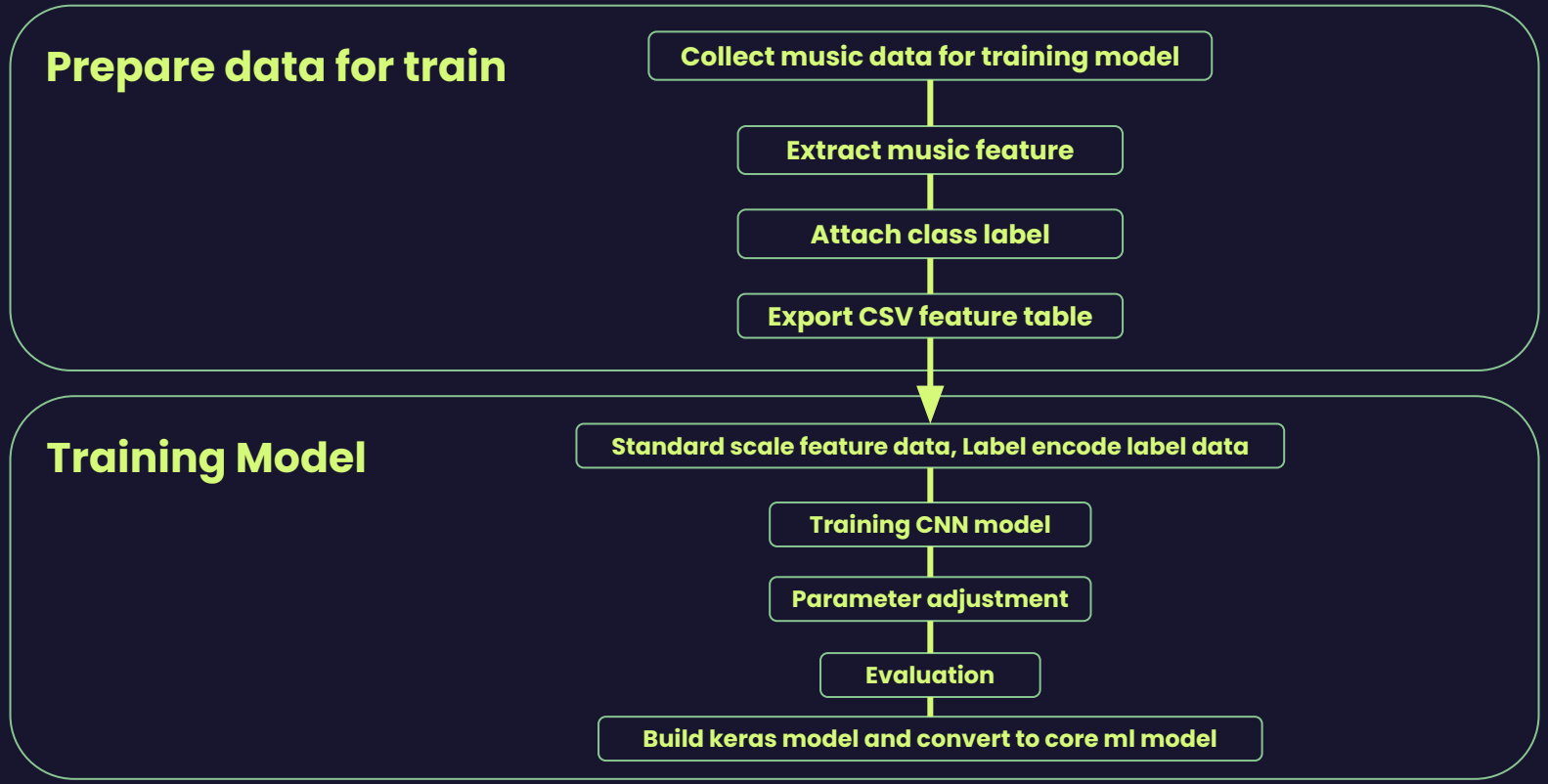

9:41
設定
個人檔案設定
First Name
Last Name
Username
Email
App設定
Appearance:
Light
Dark
Notifications:

04

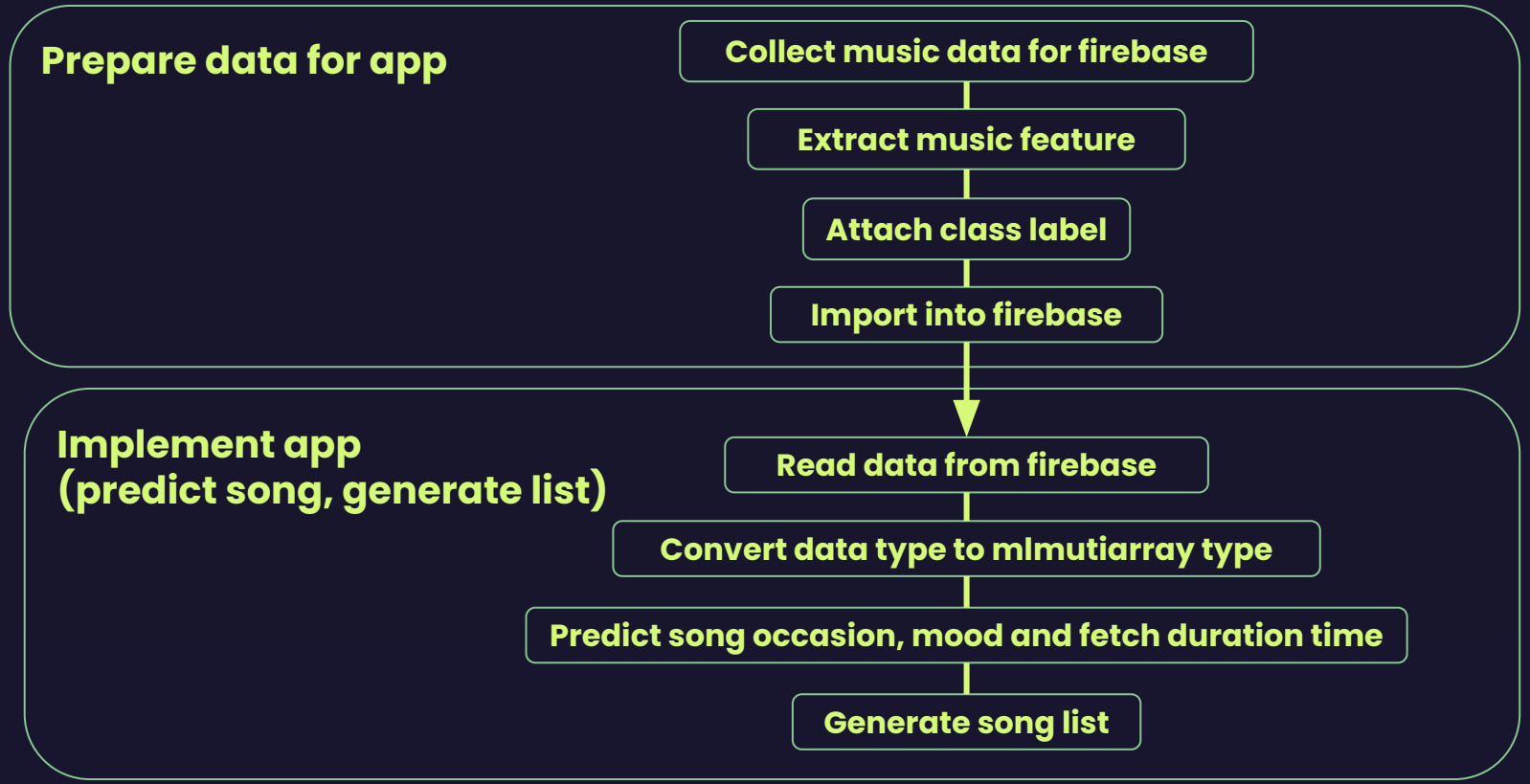
Methods & Techniques



04 Methods and Techniques



04 Methods and Techniques



04 Methods and Techniques

Collecting a large amount of music data

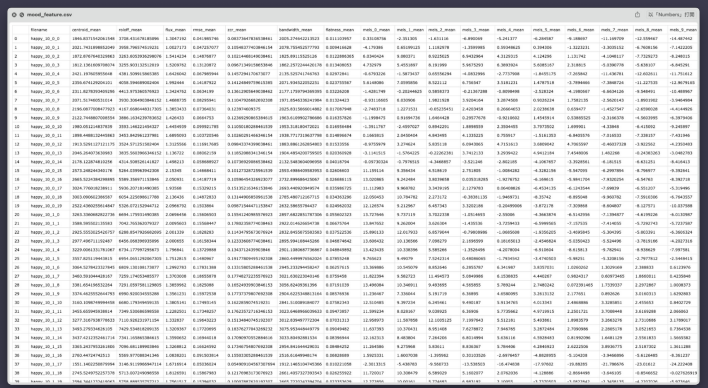
Manually collect music data according to different scenes and moods on YouTube.

04 Methods and Techniques

Extract music feature and attach label

Extract feature using Python and the Librosa library, such as Mel Spectrogram, spectral centroid, and many others, also attach label.

songs_feature.csv



04 Methods and Techniques

Training data by CNN Model

Training mood dataset and occasion dataset into cnn model by tensorflow keras.

```
# 建立神經網絡架構
model=keras.models.Sequential([
    keras.layers.Flatten(input_shape=(X.shape[1],)),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(512, activation='relu'),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(256, activation='relu'),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(128, activation='relu'),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(64, activation='relu'),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(32, activation='relu'),
    keras.layers.Dropout(0.2),

    keras.layers.Dense(8, activation='softmax'),
])
```

04 Methods and Techniques

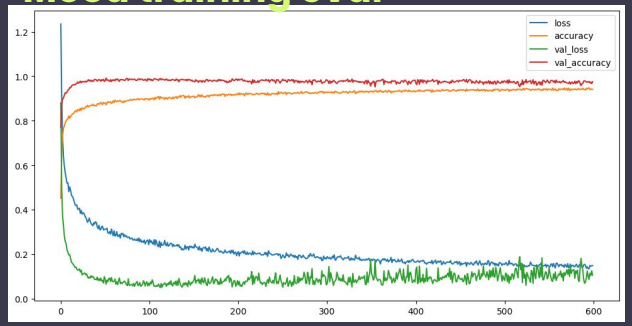
Mood CNN Model

The best accuracy is: 97%

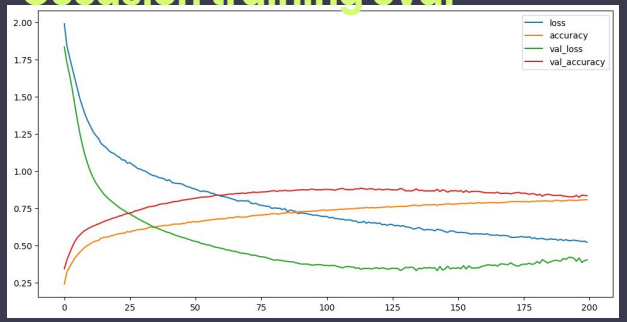
Occasion CNN Model

The best accuracy is: 80%

Mood training eval



Occasion training eval

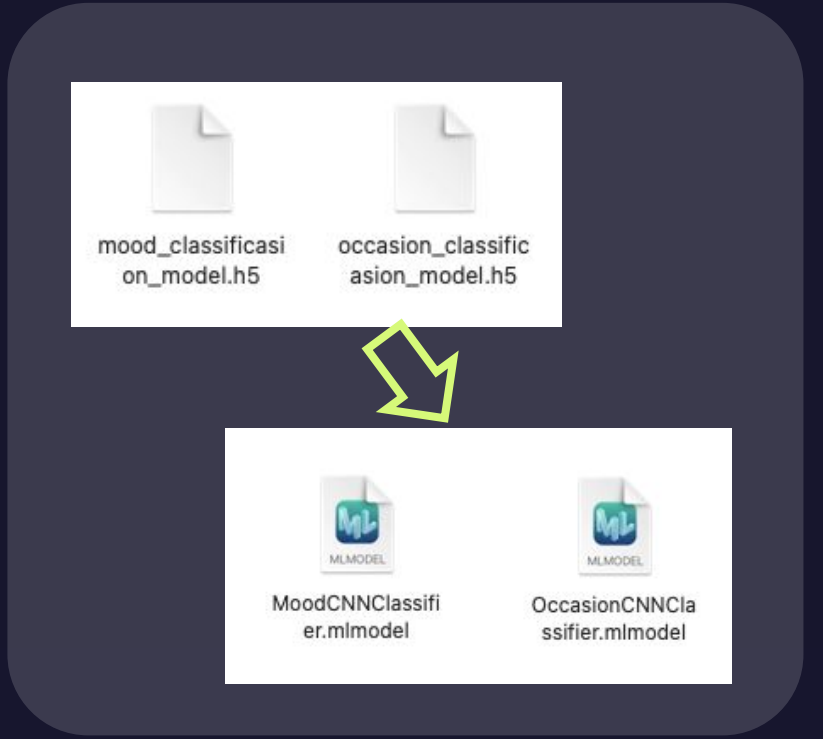


04 Methods and Techniques

Convert Model

to CoreML Model

Use coremltoos to convert model.



04 Methods and Techniques

Firebase Data ⇨ Convert into MLMultiArray ⇨ OccasionCN NClassifier ⇨ MoodCNN Classifier ⇨ Fetch Duration

Use CoreML on DJ Box

Implementing a user interface on the iOS platform.

```
// 篩選出符合 occasion condition 的 song
if let occasionPrediction = ClassifyOccasion(tensorInput) {
    if occasionPrediction.Identity[occasion.identity()].floatValue > 0.7 {
        print("occasion > \(song.title):\(occasionPrediction.Identity[occasion.identity()].floatValue)")

        // 篩選出符合 mood condition 的 song
        if let moodPrediction = ClassifyMood(tensorInput) {
            if moodPrediction.Identity[mood.identity()].floatValue > 0.8 {
                print("mood > \(song.title):\(moodPrediction.Identity[mood.identity()].floatValue)")

                // 找出最貼近 duration 的 song
                if let songDuration = Int(song.duration) {

                    // 目前 recommend song list 中的總長度
                    let curDuration = self.recommendSongs.map { Int($0.duration) }.reduce(0, +)

                    if abs(duration - (curDuration + songDuration)) <= abs(duration - curDuration) {
                        if let song_id = song.id {
                            self.recommendSongs.append(Song(id: song_id, title: song.title, duration: songDuration, url: song.url))
                            print("Current Duration: \(curDuration + songDuration)")
                        }
                    }
                }

            }
        }
    }
}
```

04 Methods and Techniques

WebKit

Playing youtube video directly in the app

```swift
import SwiftUI
import WebKit

struct ListView: View {
    @EnvironmentObject var songManager: SongManager
    @EnvironmentObject var songListManager: SongListManager

    @State private var newSongList = SongList()
    @State private var showAlert = false

    var body: some View {
        ZStack {
            Color(red: 23/255, green: 22/255, blue: 46/255)
                .ignoresSafeArea()

            VStack {
                Title(iconName: "music.note.list",title: "專屬您的歌單")

                ScrollView(.vertical) {
                    LazyVStack(spacing: 20) {
```

05

Demo

05

Demo


4:15
DJ BOX
DROP THE BEAT
Account
Password
Login
Haven't account? Sign up now.

05

Demo


4:25
Create Playlist
SongList9
SongList6
SongList8
SongList5
SongList4
SongList7

06

Problem&Solution

06

Problem&Solution

1.Youtube video can’t play on the DJ Box.

Try to connect with Youtube Data API ,it’s can only show the information of music. Can’t play directly.

Solution

Use the WebKit - WKWebView to play directly.

06

Problem&Solution

2. Accuracy is to low.

Accuracy was below 50% the first few times.

Solution

Increase the training data as possible.

Collected double Mood & Occasion song of playlists.

Thank you for listening