Workout Music Recommendation System -- “OffScore”

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Introduction

Music recommendation systems can be treated as an advanced tool to provide a powerful recommendation function for users. Common music recommendation systems usually depend on users' log streams and usage data to implement the music recommendation function, which can not combine the environment to give the song users want to hear. Especially when they exercise, they prefer music that can motivate them to exercise.

Therefore, in order to improve the current music recommendation systems, our group hopes to apply the AI algorithms based on the detection of Beat Per Minute to develop the precise recommendation services and provide users with songs that not only can fit their environment but also can help them adjust their heart rate during training and improve their exercise efficiency.

Function Design

The core functionality of this system is to implement the precise music recommendation by interacting with real-time data from users. Firstly, user will wear the T-Wristband smart bracelet, which measures the user's heart rate in real time through an embedded program. At the same time, the client on the website forms an information transmission chain with the bracelet via Bluetooth. This software can generate a music song list for the client in real time that matches the current environment through an item-based collaborative filtering recommendation and transmit it back to the website to play the recommended music.

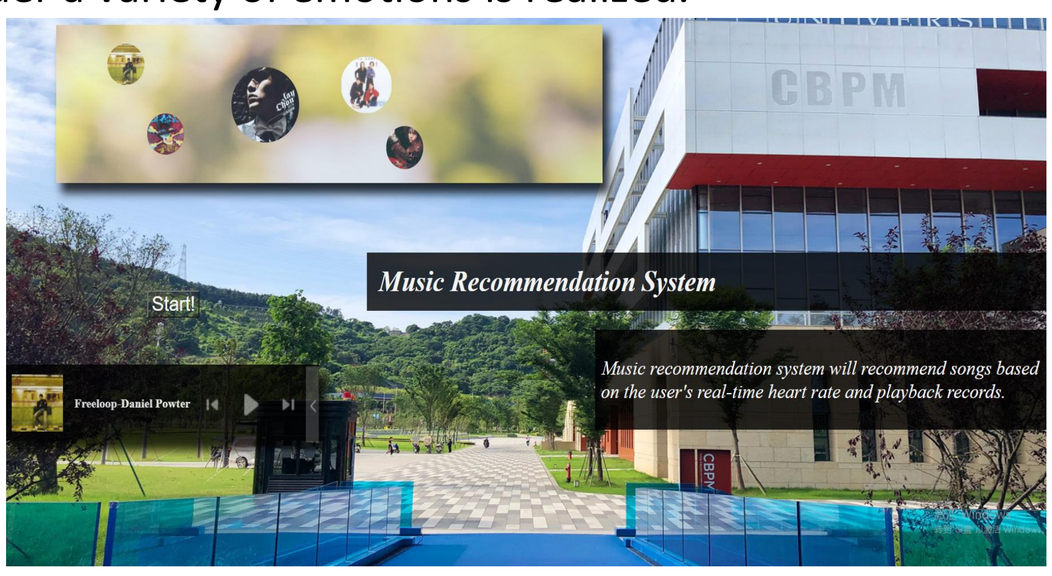
To more the recommendation system more suitable for workout music recommendation. Our recommendation system will analyze the user’s heart rate and recommend music in corresponding heart rate interval. Based on Shutterstock, the normal heart rate of adults are 60-80 BPM (Shutterstock, 2019). And as shown in the figure below, there are different heart rate intervals in different exercise periods.

Function Design(cont’)

maximun intensity	156-168BPM
anarobic exercise	144-156BPM
aerobic exercise	132-144BPM
burn fat	120-132BPM
warm up	80-120BPM
normal	60-80BPM

If the rate is in the normal range, the system will play the music in his/her favorite list. If the heart rate is increasing, that means they may start to exercise. Then the system will provide some passionate music. If the rate is decreasing, it will play some smoothing music to calm them down.

UI and front-end design adhere to the principle of concise and efficient communication design. Through the visual player, rotating pictures and clear function buttons, the played songs and supported operations can be clearly presented. By changing the background, the music playing fit under a variety of emotions is realized.



Conclusion

In this project, the pulse was analyzed, the heart rate was monitored in real time through the T-Wristband and uploaded to the app, and music of different BPM was recommended.

Through testing and analysis, there are still many problems, for example, the recommendation algorithm is not accurate enough, and different people have different personalities, so the recommended music may not be able to meet everyone's favorite, and the content in the database is not rich enough, so it cannot be better matched in the recommendation process. So in the future we will continue to enrich the database and change the stability of the algorithm.

References

Shutterstock. (2019). Health Check: what should our maximum heart rate be during exercise? The Conversation Retrieved from: https://theconversation.com/health-check-what-should-our-maximum-heart-rate-be-during-exercise-107963