Music, Mind and Technology - Assignment 4

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1.

Lecture 1: Music and Movement

This lecture was about embodied music cognition which tries to analyse music perception using action and movement. We saw how this is prevalent in our everyday life - like how people walk faster to music than metronomes and we also looked at how music induces rhythmic infants as well. The lecture then moves on to if we can predict various characteristics about a person based on their movement to music. We explored if different metrical levels affect movement, and if personality traits, gender and emotion could be predicted using these movements.

The most interesting part of the lecture was finding out that there is indeed a correlation between personality traits and how they move to music. For example, it was found that neurotics move more on the spot and use less head and hands than non-neurotics. Thus, the main takeaway was that body movements are reliable indicators of personality and how experiments studying embodied music cognition are conducted - using PCA to get the main movement features and then using a classification model.

Lecture 2: Big Data - Depression

In this lecture we talked about how big data experiments are conducted and analysed a study that tried to look at the relationship between emotion consumption and emotional health. The study used 'last.fm' data along with the user's personality and K10 scores. It was found that at-risk individuals were associated with increased number of sessions, total play count and repetitiveness index. They are also associated with decreased exploration scores. We then also looked at how the results of this study are valid because they also agree with HUMS (Healthy-Unhealthy Music Scale).

The most important takeaway from this lecture was that I learnt a new psychological rating scale called HUMS which predicts individuals at-risk for

mental health issues using their listening patterns and the kind of music they listen to.

2.

Problem statement chosen: a

A) The first step to solving this problem would be data processing followed by building a predictive model, and then using the predictions in the recommendation algorithm.

- We will first extract the low-level acoustic details of the songs like valence, energy, tempo, mode etc. and also compute listening session metrics like total playcount, number of skips, average session length.
- We then use the dispositional user traits to divide the user's into either at-risk of psychological distress or no-risk. Using their personality traits information, we can also classify them into different personality types.
- Now we train a model to predict the personality traits and risk of individuals from both usage statistics and acoustical characteristics. At this point we will also check if there is a reliable accuracy value for the model - because we would not want our recommendation system to be unreliable and potentially dangerous.
- Thus, the model can now predict if a person is at risk based on their maladaptive listening patterns. We can set a threshold for a 'maladaptive score' which is calculated based on the listening statistics and acoustical features of the music, and we can make an algorithm to flag down or not recommend any songs that could potentially put them at more risk. As an alternative, we could also offer mood-boosting music or give them some helpful resources.

B) The most important difference in how I changed my approach after taking the course is how I approach the extraction of features from the music. Before taking the course, I would most probably have stuck to only high level features like genre, and song tags. However, after having taken the course - I now know that we can extract a lot more

meaningful low level features from the music like timbre, pitch, tempo, valence and arousal and see how these correlate with psychological distress. Further, I would have only probably looked at the acoustical features of the music before, disregarding the usage statistics but now I also know about how all these characteristics are important to predict maladaptive listening patterns.

C) The main limitation of this approach is that I am not taking context into consideration. While listening to ‘sad’ songs continuously would usually be an indicator of an unhealthy listening pattern, maybe in the context of a funeral - people would tend to listen to sad songs only.