CREATING TRANSPARENT, STEERABLE RECOMMENDATIONS

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ABSTRACT

Music recommendation systems are increasingly important in the ever growing world of digital music. However, most commercial music recommenders rely on collaborative filtering techniques to generate music recommendations. These types of recommendations lack two aspects that are important for recommendation. First, they lack transparency — they cannot explain why an item was recommended beyond the trivial "Other people who listened to X also listened to Y". Second, they lack steerability — there is no way for a user to interact with the recommender to steer it toward more relevant content.

In this paper we describe the Sun Labs Music Explaura - a web-based application that provides transparent and steerable recommendations. The Music Explaura provides a detailed explanation about why a particular item was recommended and allows a user to steer the recommendations based upon attributes of the music.

1 THE AURA

In our system for recommending items, each musical artist is annotated by a set of descriptive words and phrases. The source of these words can be from text mining the web, from social annotations, autotagging based upon content analysis, expert annotation, etc. One significant source of words in our current implementation are the social tags from the social music website Last.fm, mined using the Audioscrobbler web services [1] .

Some words such as *rock* and *alternative* are commonly applied to many artists and therefore are not very descriptive, while terms such as *shoegaze* and *grindcore* are less frequently applied (and thus more discriminating). To emphasize words that are more descriptive, each term is weighted using the standard text retrieval weighting function TF-IDF. This weighting function gives more weight to words that occur more frequently for a particular item when compared to the frequency of the word across all items. The set of weighted tags for an item is called an item's "tag cloud" or in a more poetic way, it's *aura*. We use this tag cloud as a representation of an artist in our system. The similarity between two artists is merely the cosine similarity between the weighted terms in tag clouds for the artists.

[1] Last.fm's Audioscrobbler web services described at http://www.audioscrobbler.net/data/webservices/.

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2 TRANSPARENCY

One important key to the success of a music recommender is to gain the trust of its users. One way to gain this trust is to provide a detailed explanation of why an item was recommended. However, most commercial music recommenders rely on collaborative filtering techniques to offer recommendations. These systems cannot offer any more detailed explanation of why an item was recommended beyond the simplistic "people who liked artist X, also liked artist Y". These opaque recommendations do little to garner the trust of the user.

Since our recommendations are based on the similarity between the tag clouds of a preferred item and the recommended item, we can offer a more detailed explanation of why an item was recommended by showing how the two tag clouds overlap. Figure 1 shows the overlapping tags for the artists Muse and Radiohead. Only words common to the two artists are displayed. The size of the font is determined by the weight of tags and the strength of the overlap.

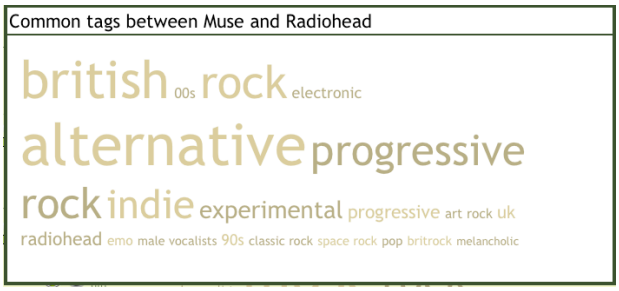

Figure 1. Common tags between Muse and Radiohead. The tags in the clouds are weighted by the strength of the overlap between the two clouds.

Figure 2. The steerable recommendations interface. Users are able to add tags or artists to the cloud by clicking on them from the right hand panel. Then, they can click and drag them to modify their size. A tag that is shrunk below the size of zero will begin to grow again as a negative tag and act as a filter in the returned recommendations.

3 STEERABILITY

When a user receives a set of recommendations based upon a seed artist, the user may decide that the recommender is giving too much weight to a certain aspect of the seed artist, and too little weight to another. In a traditional recommender, there is little that the user can do guide the recommender toward aspects that the user finds desirable. With the Music Explaura, a user has much more control over the aspects that the recommender uses to generate recommendations.

To steer recommendations with the Music Explaura, a user can interact with a tag cloud for the seed artist. The user can add tags, remove tags or adjust the weight of any tag in the tag cloud. Whenever the user makes changes, the set of recommended artists is immediately updated to include the artists that best match the new tag cloud.

For example, a fan of 60s psychedelic guitarist Jimi Hendrix could adjust the Jimi Hendrix tag cloud to give more weight to the *guitar* tag and less weight to the *60s* and the *psychedelic* tags to steer the recommender toward guitarists that sound like Jimi Hendrix, and away from other 60s psychedelia artists. The recommender would respond by recommending artists more like Stevie Ray Vaughan and less like Janis Joplin or The Doors.

Figure 2 shows an example of the steerable interface. In this example, the user has started with a tag cloud based upon the top tags for the artist Coldplay. The user has also added the artist Muse to the cloud. This has the effect of implicitly including all of the tags for Muse in the tag cloud. The user can increase or decrease the weight of an individual tag by dragging it with the mouse to increase or decrease its size. The weight of a tag can even be made negative — at which point it is colored red. Tags with negative weights act as filters — artists tagged with a negatively weighted tag will not be recommended.

Whenever the tag cloud is modified, the user immediately receives an updated list of recommendations. These are the artists that most closely match the tag cloud that the user has constructed. The user can immediately listen to a recommended artist, view photos of the artist, inspect the tag cloud of an artist or rate the artist. The user can then update the tag cloud to steer the recommendation away from undesirable artists and toward more relevant artists. This dynamic, iterative approach to recommendation puts the user in control of the recommender. Contrast this with a traditional collaborative filtering recommender that typically gives a user no control at all.

4 CONCLUSION

The Music Explaura is a tool for music exploration, discovery and recommendation that offers transparent, steerable recommendations. With the Music Explaura, a user can dynamically interact with the recommender to steer it toward more relevant content and unlike traditional recommenders, the Music Explaura can explain why an item was recommended. This transparency and interactivity not only helps the user find new and interesting music, it also can be more engaging and enjoyable for the user.