Extended Abstract for UMUAI - Special Issue on User Personality in Personalized Systems

MoodPlay: A Study of Interaction and Control for Mood-Based Recommender Systems

Ivana Andjelkovic, Media Arts and Technology Program, University of California, Santa Barbara, USA
Denis Parra, Dept. of Computer Science, Pontificia Universidad Católica de Chile
John O'Donovan. Dept. of Computer Science, University of California, Santa Barbara, USA

Self Assessment

1. What is the main scientific contribution of your planned submission?

Our submission introduces a visual interactive mood-aware recommender system of music bands. To the best of our knowledge, there is no previous work in a system that combines the features of visual interactive recommenders (such as controllability and explainability) where users can exploit the mood of a subset of items for personalized filtering.

2. What makes your reported research important?

We highlight three aspects that support the important of our research:
- we present a visual mood model, built upon music relevant moods. Previous work has relied on mood model derived from general research in psychology, that does not accurately capture a wide range of music related moods. Music possibly induces more contemplative emotions than basic evolutionary emotions captured in general mood model.
- we explore impact of mood and interactive interface built upon introduced mood model on music recommendation and user experience
- we build and visualize the user model ~~user's profile~~ within mood space based on their musical taste and relevant mood markers in navigation history. Our system updates recommendations based on a trail of user interactions with the interface, making our approach sensitive to a both previous history (prior knowledge) and navigation over the session.

3. Why does your planned submission fit into the scope of the special issue?

The main topic of this specials issue is on studying the effect of personality, affect and emotion on personalized systems. Mood is the main component for filtering the recommended items in our interface, making a relevant fit for this special issue.

4. What are the main limitations of your approach?

Although MoodPlay could be easily implemented in different domains where the items can be located in a "mood space", this particular submission deals with the recommendation of music bands, so a note of caution must be taken to generalize our results to other domains.

5. Please cite 2-3 publications that are closest to your planned submission.

Hijikata, Yoshinori, Yuki Kai, and Shogo Nishida. "The relation between user intervention and user satisfaction for information recommendation." In*Proceedings of the 27th Annual ACM Symposium on Applied Computing*, pp. 2002-2007. ACM, 2012.

Lee, Seungjae, Kim, Jung Hyun, Kim, Sung Min and Yoo, Wonyoung. "Smoodi: Mood-based music recommendation player.." Paper presented at the meeting of the ICME, 2011.

Bogdanov, Dmitry, Haro, Martín, Fuhrmann, Ferdinand, Xambó, Anna, Gómez, Emilia and Herrera, Perfecto. "A content-based system for music recommendation and visualization of user preferences working on semantic notions.." Paper presented at the meeting of the CBMI, 2011.

Extended Abstract

Recommender systems are popular tools for predicting content that a target user is likely to be interested in. However, despite the large amount of research into these systems, little has been done to understand the impact of a user's personality or mood at the time a recommendation is produced by the automated system. Recent research on interaction with [Knijnenburg12, Parra14] and explanation of [Herlocker00, Tintarev07] recommender systems provide initial insight into the user experience as they interact with prediction algorithms during a recommendation session. In this paper, we build on this prior work and explore the impact of user mood on the recommender system's predictions and on the overall user experience. Existent online services such as MoodSnap (http://www.moodsnap.fm/) and Stereomood (http://www.stereomood.com/) already allow the users to search and filter music tracks by mood, however, they do not provide a visual interactive interface such as MoodPlay, which allows the users to explore and get recommended music bands arranged in a mood space.

Before we can incorporate mood information into the mechanics of a recommendation algorithm, and understand its effects, we require a mechanism for eliciting mood preference at recommendation time. To this end, we present *MoodPlay* --a novel interactive tool designed to explain mood metadata about items and elicit mood preferences of a target user through simple interactive gestures in a two dimensional mood space, shown in Figure 1.

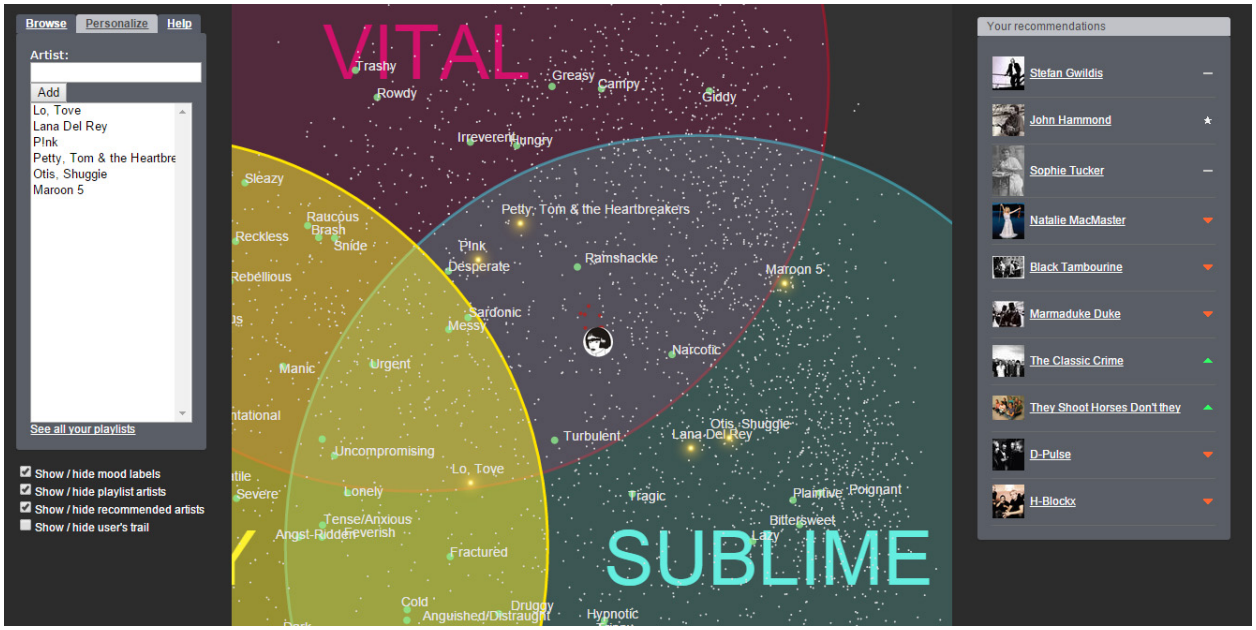

Figure 1: Screenshot of the MoodPlay recommender system.

We describe a user experiment (N=XXX) to evaluate two treatments of mood information over a benchmark content-based recommendation [Parra14]. We evaluate the impact of mood information on recommendation accuracy and on a range of subjective user experience metrics.

Conditions research model and hypotheses

This study has the following 3-by-2 conditions:

	List-Based	Interactive Visualization	Trail-based Interactive Visualization
Content	Simple list of content recommendations based on profile only	Content-based recs, shown in the visual interface	Full interaction in the visual interface with content-based recs only
Mood	Simple list of mood+content recs	mood and content recommendation, shown in the visual interface	mood and content recommendations with full interaction.
User-controlled Hybrid			

Optimized hybrid. (remove?)			

References

Knijnenburg12
Parra14
Herlocker00
Tintarev07

Extended Abstract

Recommender systems are popular tools for predicting content that a target user is likely to be interested in. However, despite the large amount of research into these systems, little has been done to understand the impact of a user's personality or mood at the time a recommendation is produced by the automated system. Recent research on interaction with [Knijnenburg12, Parra14] and explanation of [Herlocker00, Tintarev07] recommender systems provide initial insight into the user experience as they interact with prediction algorithms during a recommendation session. Incorporating information about user's moods improves performance of recommendation algorithms [Tkalcic10], and is particularly important when content strongly correlates with user's feelings (music, visual art). In this paper, we build on the prior work and explore the impact of user mood on the recommender system's predictions and on the overall user experience.

Before we can incorporate mood information into the mechanics of a recommendation algorithm, and understand its effects, we require a method for eliciting mood preference at recommendation time. To this end, we focus on music recommendation domain and present *MoodPlay* – a novel interactive tool designed to explain mood metadata about items and elicit mood preferences of a target user. Existent online services such as MoodSnap (http://www.moodsnap.fm/), Stereomood (http://www.stereomood.com/), Spotify (http://www.spotify.com) and Habu (http://www.habumusic.com) already allow the users to search and filter music tracks by mood. Unlike existing systems, MoodPlay provides visual interactive interface based on a music specific mood model [Zentner11], depicts users' preferences within in it and allows the users to explore and get recommended artists arranged in the two dimensional mood space.

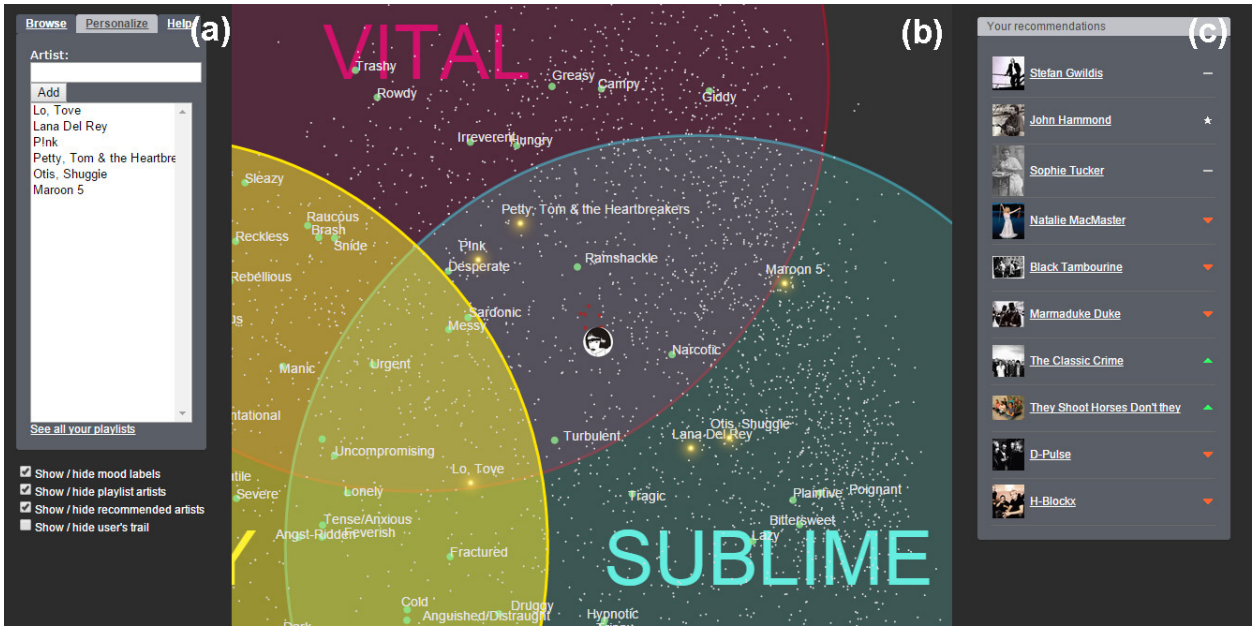

Figure 1: Screenshot of the MoodPlay recommender system: (a) User provided playlist, (b) mood space containing user node positioned based on prevailing moods in the provided playlist, (c) recommended artists

We implement three modes of user interaction with the system to support mood based recommendation and later evaluate the impact of mood on recommendation accuracy and user experience. First, we allow users to adjust how much significance should be given to mood information in the recommendation process. Second, we facilitate user movement through the mood space and generate recommendations based on the current position, which indicates current mood preference. And third, as the user moves, we track relevant positions in the mood space and provide trail-based recommendation, which accounts for moods encountered during the exploration.

We conduct a user study (N=XXX) to evaluate two (three?) ~~treatments~~ conditions of mood information over a benchmark content-based filtering recommender, as the one used in Parra et al. [Parra14]. Specifically, we compare mood-based and content-based recommendations over following conditions: (1) static recommendations in the form of ordered lists, generated based on user's taste profile (2) dynamic recommendations generated using current mood preference and (3) dynamic, trail-based recommendations generated based on a set of moods. We expect to observe improved recommendation accuracy in mood-based trials, and increased user satisfaction with the controllability and transparency offered by the system in fully interactive trials.

References

Knijnenburg, Bart P., Svetlin Bostandjiev, John O'Donovan, and Alfred Kobsa. "Inspectability and control in social recommenders." In *Proceedings of the sixth ACM conference on Recommender systems*, pp. 43-50. ACM, 2012.

Parra, Denis, Peter Brusilovsky, and Christoph Trattner. "See what you want to see: visual user-driven approach for hybrid recommendation." In *IUI*, pp. 235-240. 2014.

Herlocker, Jonathan L., Joseph A. Konstan, and John Riedl. "Explaining collaborative filtering recommendations." In *Proceedings of the 2000 ACM conference on Computer supported cooperative work*, pp. 241-250. ACM, 2000.

Tintarev, Nava. "Explanations of recommendations." In *Proceedings of the 2007 ACM conference on Recommender systems*, pp. 203-206. ACM, 2007.

M Tkalčič, U Burnik, A Košir, “Using affective parameters in a content-based recommender system for images”, User Modeling and User-Adapted Interaction, 2010

M. Zentner and T. Eerola, “Self-report measures and models of musical emotions,” in Handbook of Music and Emotion: Theory, Research, Applications, Oxford, New York: Oxford University Press, 2011, pp. 187–223.