



Interactive Music Genre Exploration with Visualization and Mood Control



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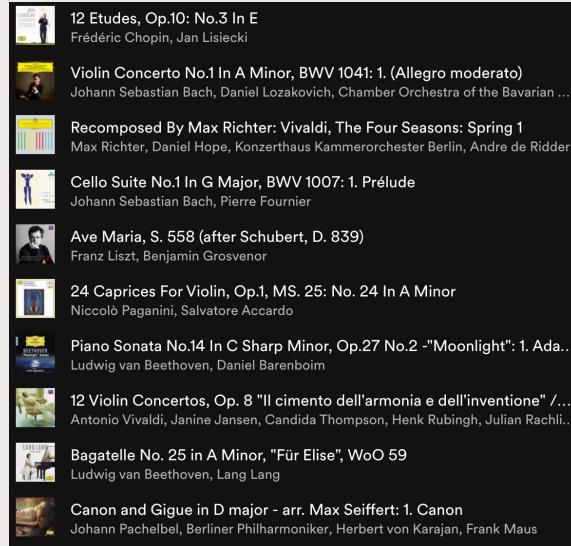
Background

Traditional recommender system is good at finding items close to a user's current preference

I like to listen to
mandapop a lot



But one day I want to try
some classical music...



Previous work

Content-based recommendation based on audio features)

Selected Music Genres

Mixed

Baseline for genre-typical recommendation

SAVE PLAYLIST TO MY SPOTIFY

Playlist A (10 songs)

- Suddenly Spring
Bochum Welt
- Ralome
Plaid
- Allotropic
Kid Koala
- A Trick of the Light - Bibio Remix
Villagers, Bibio
- Blown
LFO
- blue sky and yellow sunflower
Susumu Yokota
- Babylon
Oneohtrix Point Never
- Black Coffee
Nearly God
- Mr. Mukatsuku
Wagon Christ
- Glow
Deepchord

Mixed: most helpful esp. for users

Little control over the recommendations
Lack of transparency
Harm the helpfulness

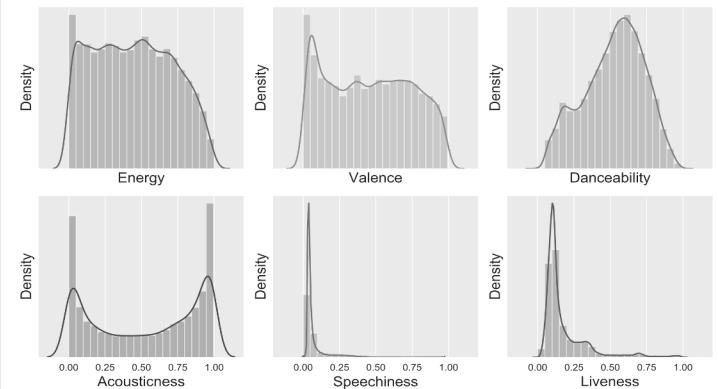


Fig. 1. Audio feature distribution for the genre dataset

[Millecamp, M., Htun, N. N., Jin, Y., & Verbert, K. 2018]

[Bostandjiev, S., O'Donovan, J., & Höllerer, T. (2012)]

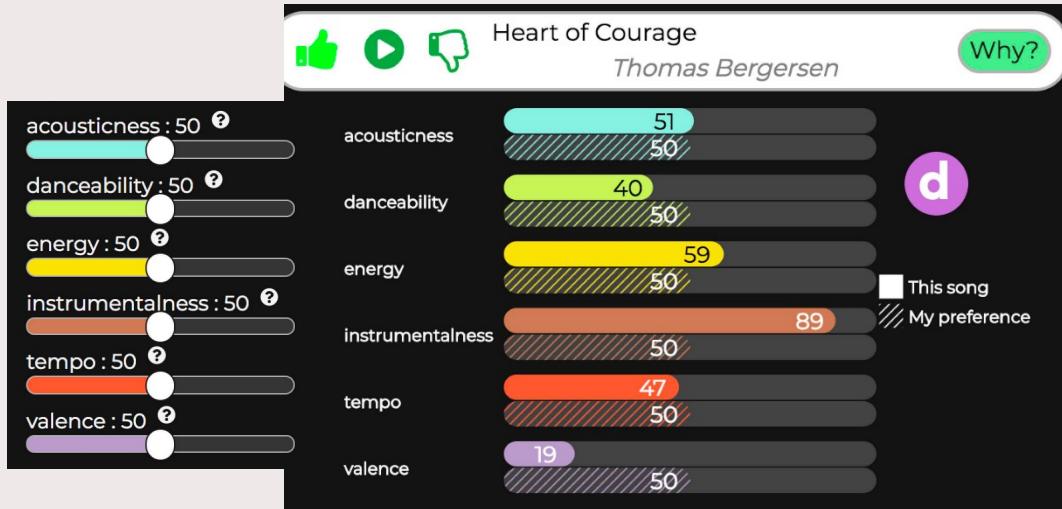
[Andjelkovic, I., et al. 2019], [He, C., Parra, D., & Verbert, K. 2016]

How to better support users to explore a new music genre

The screenshot shows the journal page for "Expert Systems With Applications". The article title is "Interactive recommender systems: A survey of the state of the art and future research challenges and opportunities" by Chen He, Denis Parra, and Katrien Verbert. The journal homepage is listed as www.elsevier.com/locate/eswa. The article was received on November 17, 2015, revised on January 18, 2016, accepted on February 8, 2016, and available online on March 2, 2016. The abstract discusses the evolution of recommender systems and their impact on user satisfaction, trust, transparency, and control. It presents an interactive visualization framework combining recommendation with visualization techniques.



How to better support users to explore a new music genre?



[Millecamp, et al. 2019]

Bar charts

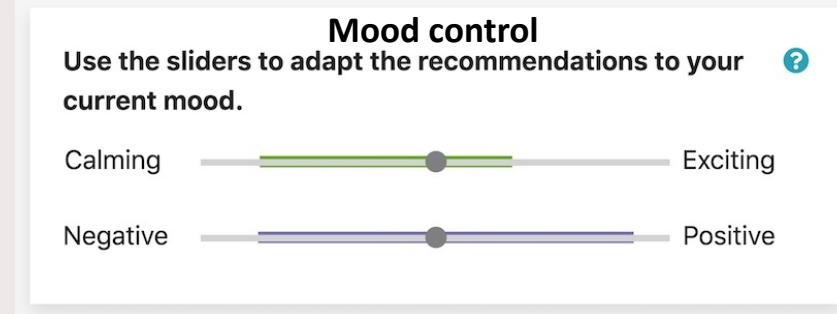
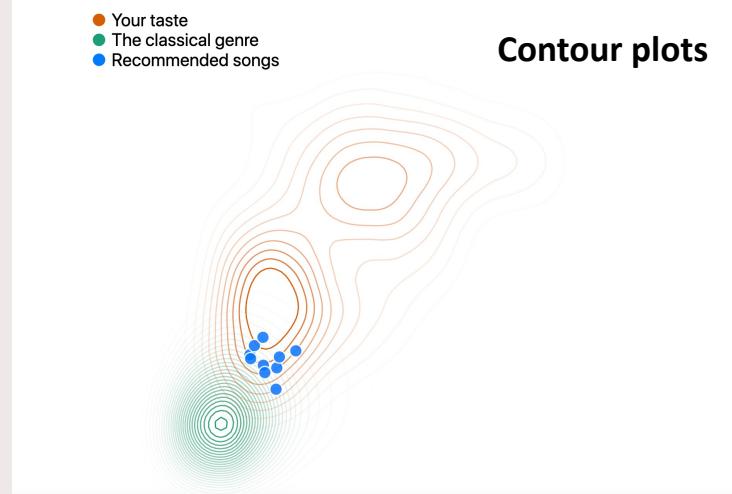


Easy to understand

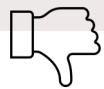


Not very informative: present only the averaged preferences

How to better support users to explore a new music genre?

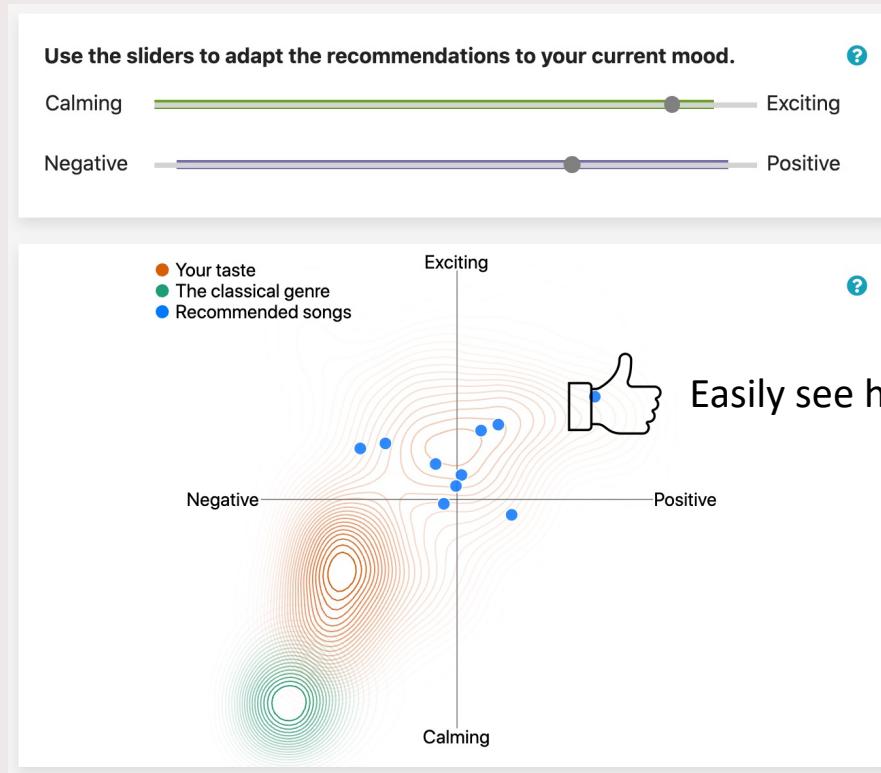


- 1) Show the relation between the recommendations , users' current preferences and the selected genre
- 2) Show the preference intensity of users



A bit hard to understand

Contour plot + Mood control



Research questions

RQ1: How do different types of visualizations (bar charts/contour plots) influence the perceived helpfulness for new music genre exploration?

RQ2: How does mood control improve the perceived helpfulness for new music genre exploration

Study design

2X2 mixed factorial design:

- Mood control: between-subject
- Visualization: within-subject

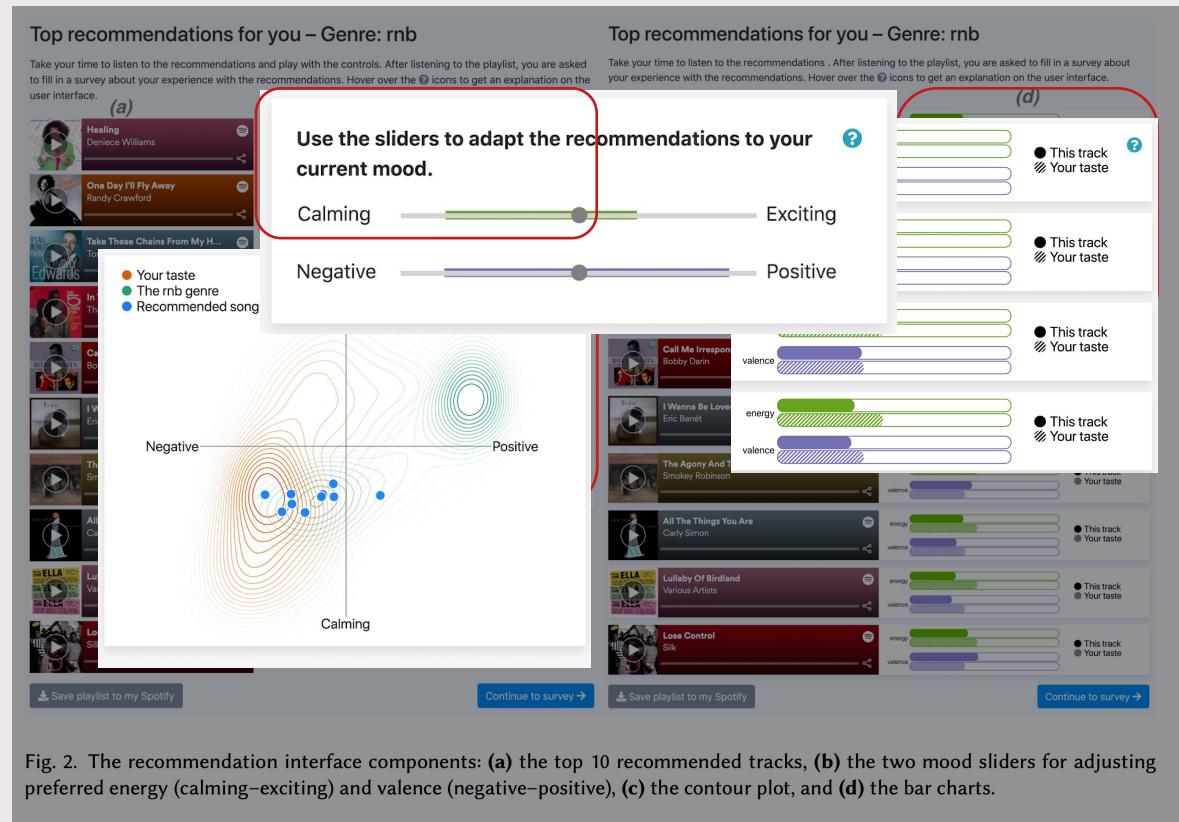


Fig. 2. The recommendation interface components: (a) the top 10 recommended tracks, (b) the two mood sliders for adjusting preferred energy (calming–exciting) and valence (negative–positive), (c) the contour plot, and (d) the bar charts.

Measurements

[Knijnenburg, B. P., et al. 2012]

- Subjective measures: post-task questionnaires
 - Perceived helpfulness, perceived control, perceived informativeness and understandability
- Objective measures: user-interactions with the system
- Musical Sophistication (active engagement & emotional engagement)
- Participants: mainly university students
- 102 valid responses

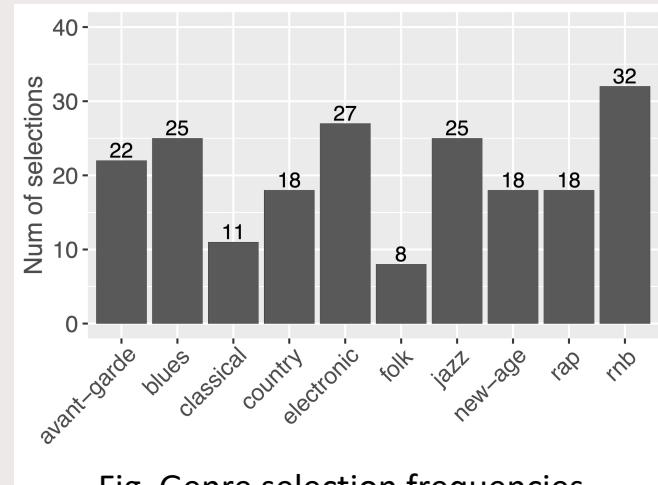
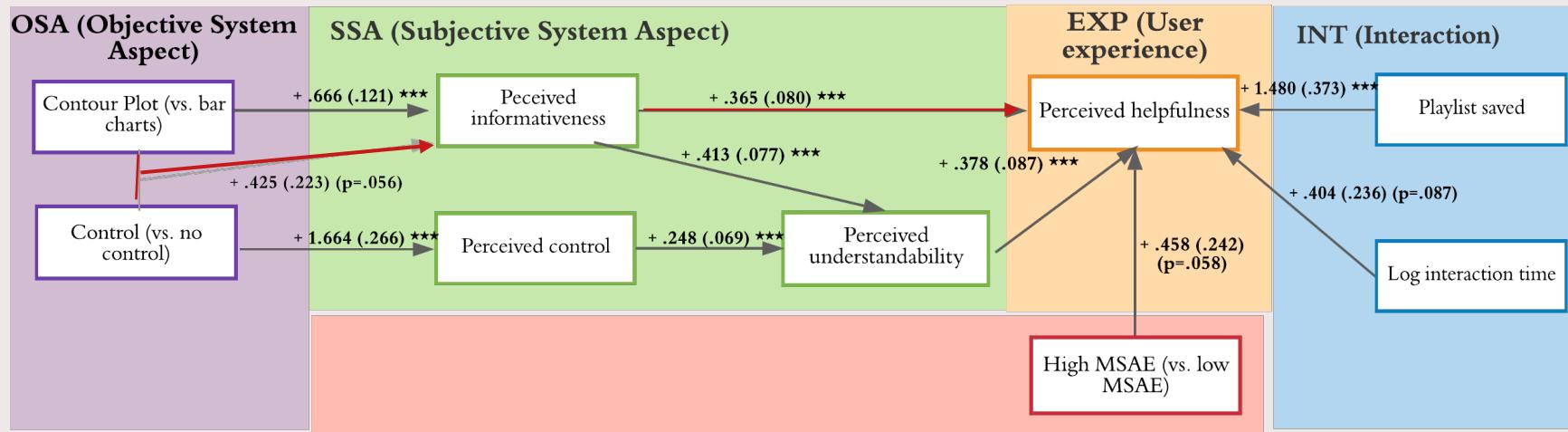


Fig. Genre selection frequencies

Which is more helpful?



Contour plot (vs bar charts):

- More helpful
- Total effect: $\beta = .378$, $se = .082$, $p < .001$

Control (vs no control):

- Seems to be more helpful
- Total effect: $\beta = .238$, $se = .123$, $p = .053$ (marginal significant)

Contour + control:

- More helpful
- Total effect: $\beta = 0.242$, $se = 0.123$, $p = .049$.

What we have found....

- Contour plot is perceived more helpful for new genre exploration than the bar chart
 - More informative
 - More understandable
- Mood control itself does not make the system more helpful
- Mood control paired with the contour plot benefits the perceived helpfulness most due to the increased informativeness

Future work

- Extend the study with more people with different occupations and educational levels

