Millions of tracks at the fingertips of music researchers

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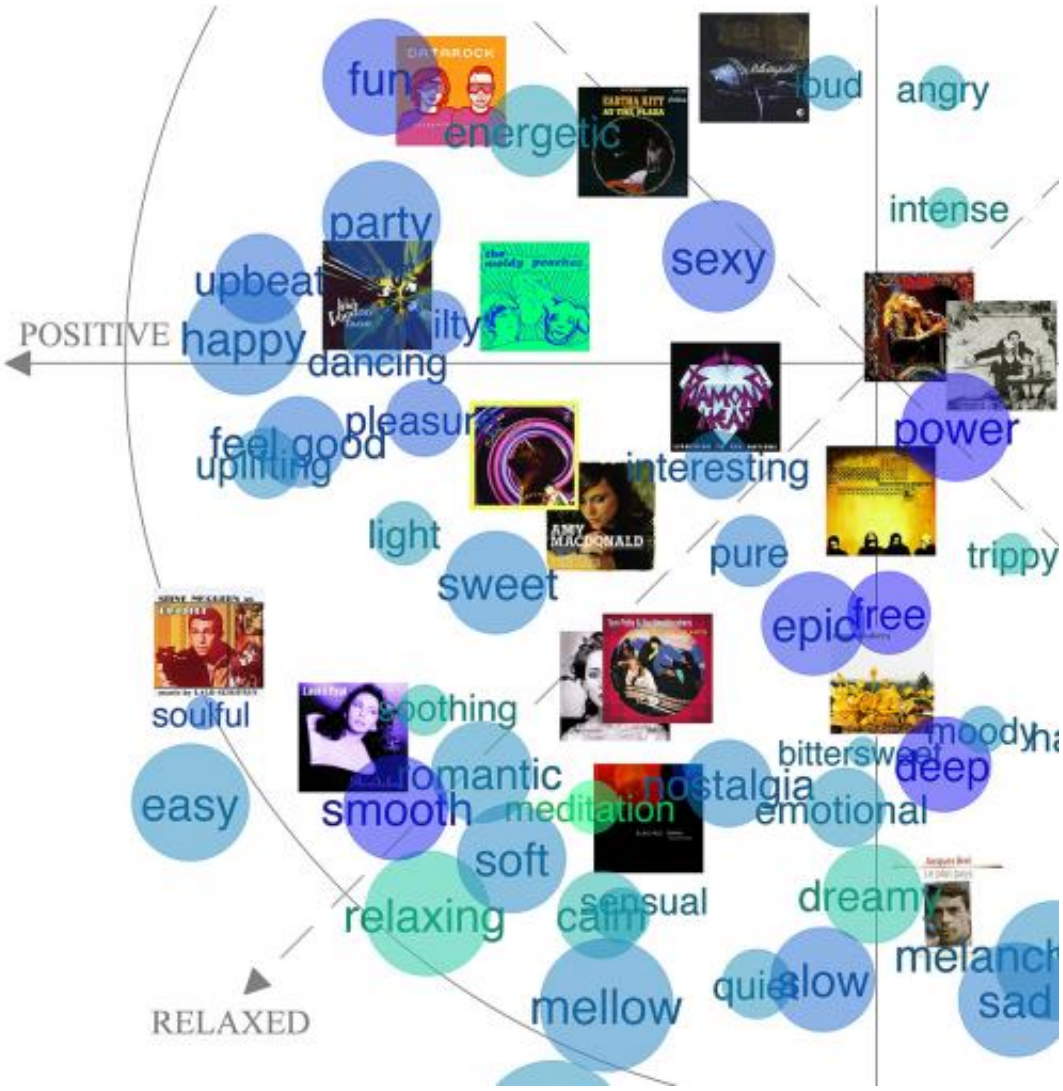

The attached figure shows certain tags and tracks in a two-dimensional emotion model. Credit: Pasi Saari / University of Jyväskylä

Online digital music services, such as Last.fm and Spotify, contain semantic information produced by users worldwide about millions of music tracks. A new method now enables exploiting this vast source of information in order to understand the processes behind expressions of musical moods.

Doctoral student Pasi Saari and Professor Tuomas Eerola, researchers at the Academy of Finland's Finnish Centre of Excellence in Interdisciplinary Music Research at University of Jyväskylä, investigated how reliable information social tags, user-generated free-form markings, convey about moods expressed by music. They also developed a new method based on semantic modeling to predict listener ratings of musical moods with online data. The study enables a giant leap forward in the size of research data – past research has exploited data in the size of few dozens to few hundreds of tracks.

The new method was developed using tags related to over one million tracks obtained from popular Last.fm service. About one fourth of the tracks contained mood tags, such as happy, chill-out, or powerful. A model resulting from several analysis stages could predict the semantic meaning of tags and tracks.

In a listening test 59 participants rated moods, such as energy/calmness, positive/negative, tension and sentimentality, in six hundred tracks from different genres. These ratings were then compared to the semantic estimates obtained with the new method.

Users of online social music services use tags often when searching or marking new interesting music, tracks from a certain genre, or to match the music to their own mood. Tags provide excellent material for music applications, since exploiting vast sources of information is a key to develop applications that can understand music more efficiently than before.

"When receiving an audio file, a computer application could identify the moods expressed by music, genre and performer, or generate automatically a playlist for a certain person in a certain mood or for training music at gym," Pasi Saari describes.

Moods related to music are considered one of the main reasons why music is listened and performed in the first place. This is why understanding musical moods is important. Large-scale information helps to solve a problem of how to manage a music collection that contains all tracks ever recorded.

More information: Saari, Pasi, and Tuomas Eerola. (in press, available online): Semantic Computing of Moods Based on Tags in Social Media of Music. *IEEE Transactions on Knowledge and Data Engineering*. DOI: 10.1109/TKDE.2013.128

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