Musical thumbnailing: support understanding of music content

Diploma Thesis

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Outline

- Motivation
- Related Work
- Concept
- Online Survey
- Current Status & Further Directions
  - Expert Group
  - 30-sec Clip
- Next Steps
- Questions & Discussion
Motivation

- Thumbnail: People can tell what one photo is about
- Musical Thumbnail: Musical overview of a song
  (visual / acoustic)
- Meaningful Design
  (consistent mapping including transparency and traceability)
- Current content analysis of music works not well enough
- Integrate User feedback to improve performance
- Motivate people to make contribution

Yoshii and Goto – [ISMIR, 2008]
Related Work

• Tzanetakis, Essl and Cook [DAfx-02]: HUMAN PERCEPTION AND COMPUTER EXTRACTION OF MUSICAL BEAT STRENGTH
Related Work

- Wattenberg [INFOVIS, 2002]: Arc Diagrams: Visualizing Structure in Strings

- Represent similarity in notes

- Composition of song (Song structure, Musical form)
Related Work

Kolhoff, Preub and Loviscach [CGIP, 2006]:
Music Icons: Procedural Glyphs for Audio Files
Related Work

- Tzanetakis and Cook [ISMIR, 2000]: Audio Information Retrieval (AIR)
Online Survey with visual thumbnails

- Comparison of these 4 concepts: Are they working?
- Simplifying concept of SemantIcons:
  - Colour of receptacle: Genre (for surveying purposes no direct assignment of genre)
  - Amount of petals: Tempo (4 - slow, 8 – medium tempo, 16 - fast)
  - Shape of petals: Aggressiveness (round – calm, curved – aroused, tapered – aggressive)
Online Survey - Demography

- Target Group: Mainly Last.FM Users
- Participants: 38 valid (80)
- Age: 18 - 53 (ø age: 26,6)
- Gender: 24% female, 76% male
- Nationality: US, UK, Can, Cro, NL, F, Ger, GR, N, P, Rus, Esp, Swe
- Occupation: 50% Student, 32% Employee, 18% Unemployed/Self-Employed
Online Survey - General experience

- How often listen to music: 70% > 3 hours/day
- Experience in music: 66% 4 or 5 (1-5 scale)
- Quite familiar with music related terms overall
- Discovering new music: Others‘ recommendations 66%, Popular Lists (Billboard Charts)76%, Web pages 74%

Methods to get overall impression of a song:
- 30-sec Clip: 67% 4 or 5
- Similar Artists/Tracks 42% 4 or 5
- Top tags : 34% 4 or 5
  - Genre : 18% 4 or 5
- Visual thumbnail: 13% 4 or 5
Online Survey - Visualization

Familiar with most songs presented

Which song is represented by this Visualization?
- Histogram: 23.7% Nirvana – Smells like Teen Spirit
- ArcDiagram: 21.1% Beastie Boys - Fight for Your Right
- SemantIcon: 36.8% Miles Davis – So What
- TimbreGram: 31.1% Red Hot Chilli Peppers - Scar Tissue
Online Survey - Visualization

Which of the 4 Visualizations displays this song?

- 4 Histograms: 42.1% Police - Message in a Bottle
- 4 ArcDiagram: 26.3% Joy Division – Love will ..
- 4 Semanticons: 44.7% AC/DC – Highway to Hell
- 4 TimbreGram: 21.1% U2 – One

Which Genre is represented by these 4 visualizations?

- 52.6% Rock (6 options)
Online Survey - Result

- Loss of participants: 9 quitted before visualization part, 33 skipped
- 27 of 38 dislike any visualization

Is this visualization helpful to get the following information?
Current Status & Further Directions

- Shift Target Group: from normal users who have no professional knowledge with music to professionals who practically analyze the content, structure or composition of songs.

- Acoustic thumbnail (30-Second Clips): it is claimed in the survey that most of participants rate 30-mins clip is most helpful for understanding an unknown song.
Next Steps – Expert Interviews

- Information which can be extracted from visual or acoustic content.
- Is visual information helpful?
- Current methods of teaching/learn professional knowledge.
- Are there problems or difficulties with current methods?
- Will our visualization concepts help?

If we get some positive Feedback

Target group as professionals and produce visualizations for them
Questions & Discussion