Novel User Interfaces for Audio

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Music Consumption
Music Making
Music Production
How to win the next Grammy?
Interfaces for audio have a huge burden of tradition.

Can we use computers to do better?
Agenda

× Music Icons
× Mood and Music
× Subjective EQ
× Rhythmic EQ
× Electrotactile Fader
× Ongoing Work
× Conclusion
Music Icons

Demo

[Video]
Music Icons

Learning and retrieval

Acoustic Features

Training

Neural Net

Retrieval

Acoustic Features

Icon Parameters

Icon Parameters
Music Icons

Sorting
Music Icons

Sorting

Nothing else matters
Metallica
Black Album
Music Icons

Mobile
Music Icons

User Testing
Mood and Music

Create an end-to-end system, comparable to color management.
Mood and Music Player
Mood and Music

Game Control (CfP II)
Mood and Music

Mood Models

- Forward
- Backward
- Act
- Pass
- Neg
- Pos

- Aggressive
- Longing
- Sad
- Frustrated
- Act
- Bright
- Neg
- Pos
- Pass
- Relaxed
- Monotonous
- Passionate
Subjective EQ

Old-school graphic equalizer: hard to control
Subjective EQ

Sound pros use descriptive terms
Subjective EQ

Arrange those terms by similarity of curves. Blend.

One point controls the EQ.
Rhythmic EQ

[Demo]
Rhythmic EQ

Architecture

40 x 120 Rhythmic Filters

40 Audio Filters

User Interface

Beat Spectrum

Level and Phase Adjustments

Control Processor

Analysis Data

Control Data

Audio Path

Left Input

Right Input

Left Output

Right Output
Electrotactile Fader

Short high-voltage pulses to
× communicate virtual detents/markers or
× a track’s content
Electrotactile Fader

Virtual markers/detents
Electrotactile Fader

Spectrum Display [Demo]
Ongoing Work

Live performance control

* Upcoming master's project: interfaces for musical instruments.
  What's different in terms of HCI?
  E.g.: A piano has no key named Undo.

* Video performances to accompany live music
Live Video Performance
Live Video Performance
## Live Video Performance

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>Intro</td>
<td>Live video setup beginning.</td>
</tr>
<tr>
<td>00:10</td>
<td>Opening</td>
<td>Introduction of performers.</td>
</tr>
<tr>
<td>00:30</td>
<td>Performance 1</td>
<td>Musical performance with live band.</td>
</tr>
<tr>
<td>01:15</td>
<td>Performance 2</td>
<td>Performance with dance group.</td>
</tr>
<tr>
<td>02:00</td>
<td>Performance 3</td>
<td>Another musical performance.</td>
</tr>
<tr>
<td>03:00</td>
<td>Conclusion</td>
<td>Closing sentences from performers.</td>
</tr>
</tbody>
</table>

**Notes:**
- Performance 2 includes a special guest appearance by a well-known artist. |
Live Video Performance

From scribble to software

[Demo]
Conclusion

* Music and audio offer much unchartered terrain for new ideas in HCI.
* Try to learn something general about HCI from music and audio.