An Approach for Developing A Mobile Accessed Music Search Integration Platform

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IR DOMAIN & MUSIC SEARCH

multimedia

music search

information retrieval

internet
SEARCHING MUSIC:
FROM MELODY IN MIND TO THE RESOURCES ON THE WEB

- Music Search
  - Text
  - Melody
  - Audio
  - Note Score
  - Human Remembrance

- Algorithms
- Interfaces
- Representations
MUSIC SEARCHING SERVICES

User inputs
- Audio fragment
- Melody fragment

Auditory and Applications
- Commercial purposes
- Musicology and research
- Authorship recognition
WAYS TO PROVIDE MUSIC INPUT

- Hum a melody fragment
- Play music by using virtual instruments
- Tap a rhythm
- Define a melody contour
- Write notes
- ...

OUR DESIGN TASK

Developing a mobile application to access existing music searching services

• Searching query construction on the base of the given melody fragment
• Support for various styles of music input query
• Query style transformation so as to fit the requirements of music searchers
• Android based
WHY MOBILE? WHY ANDROID?

- Mobility
  - Searching at any place
  - 24/7
- Touch screens
  - Changed dramatically user interfaces
- Platform is not essential
  - We use Android to illustrate basic ideas
- Access without using a browser
  - Less traffic
  - No browser compatibility problems
  - Designing a domain-sensitive interface
SUPPORTED SEARCHING SERVICES

- Musipedia
  - Melody Contour
  - Rhythm
  - Notes
  - http://www.musipedia.org/

- FolkTuneFinder
  - Melody Contour
  - Notes
  - http://www.folktunefinder.com

- Music Ngram Viewer
  - Notes
  - http://www.peachnote.com
SUPPORTED QUERY STYLES

- Simple graphical interface for note score
  ![Note Score](image1)

- Rhythm tapping and graphical representation
  ![Rhythm Tapping](image2)

- Melody contour (Parsons code)
  ![Melody Contour](image3)

- Virtual keyboard
  ![Virtual Keyboard](image4)
**INTERFACE VIEWS**

- **Note Score**
  - MUSIC SCORE
  - search
  - reset

- **Melody Contour**
  - MELODY CONTOUR
  - Up
  - Repeat
  - Down
  - UURDDDDRUUR
  - search
  - reset

- **Rhythm**
  - RHYTHM TAPPER
  - Tap the rhythm

- **Virtual Keyboard**
  - VIRTUAL PIANO
  - search
  - reset
INPUT STYLE TRANSFORMATIONS

VKB, MIDI → Rhythm

VKB, MIDI → URD

Notes → Rhythm

Notes → URD

URD → VKB, MIDI

URD → Rhythm

Pitch, onset time, duration

Onset time

Compare pitches
APPLICATION ORGANIZATION

- Query input style choosing
- Interfaces
- List of Note objects
- Searching results presentation
- Query construction
- Connection to searching services via supported protocols
WEB PROTOCOL ADAPTERS

Application

Classes for interaction with searching services

Musipedia

FolkTuneFinder

PeachNote

SOAP adapter

REST adapter

Internet

Searching services

SOAP

Musipedia

REST

FolkTuneFinder

REST

PeachNote
AN EXAMPLE OF MUSIC INPUT

Note object attributes

- name
- octave
- onset time
- end time
- Musipedia
  - Symphony No.4 f-moll by Piotr Tchaikovsky

- FolkTuneFinder
  - “The Birch Tree”, Russian folk song
USAGE EXAMPLE:

MUSICOOLOGY VIEW
APPLICATION SUMMARY

✓ Current Features
  ✓ 4 interfaces for music query input
     ✓ Note score. Parsons code. Rhythm. Virtual keyboard
  ✓ 3 supported searching services
     ✓ Musipedia, FolkTuneFinder, Music Ngram Viewer
  ✓ Query visualization
  ✓ Input style transformation

✓ Drawbacks and Future Work
  ✓ Passing the audio query to searching services
  ✓ Graphical interfaces for drawing a contour or rhythm
  ✓ Tagging
  ✓ Support for MIDI-devices
  ✓ Other…
CONCLUSION

✓ Music represented in symbolic form
✓ Overcoming limitations of fingerprinting techniques
  ✓ Shazam doesn’t solve all the problems!
✓ A variety of styles of user inputs used in various music searching services and applications
✓ Music query transformation
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✓ Connecting different kinds of searching services with rich user input facilities so as to follow better the usage style of modern mobile devices