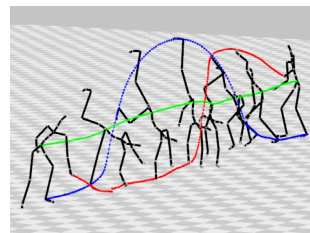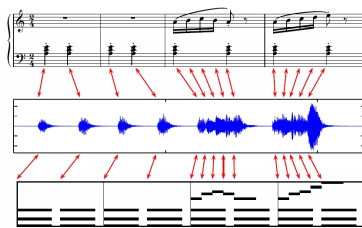Lecture

Information Retrieval for Music and Motion

Meinard Müller

Max-Planck-Institut für Informatik
Campus E1 4, 66123 Saarbrücken, Germany
meinard@mpi-inf.mpg.de

1 Organization

- Summer term 2008, Thu. 16-18
- First Lecture: Thu. 17.04.2008
- http://www.mpi-inf.mpg.de/departments/d4/teaching/sose2008/ir_mm/index.html
- Contact: Meinard Müller, meinard@mpi-inf.mpg.de
- Contact: Andreas Baak, abaak@mpi-inf.mpg.de

2 Content

In this course, we study fundamental algorithms and concepts for the analysis, classification, indexing, and retrieval of time-dependent data streams considering music and audio data as well as motion capture data as examples. Important aspects concern the design of suitable features, the notion of similarity used to compare data streams, as well as data organization. One general goal of this tutorial is to highlight the interplay between modeling, experimentation, and mathematical theory as well as to give some insights into active research fields.

3 Course requirements

In this course, we discuss a number of current research problems in multimedia information retrieval covering aspects from information science, digital signal processing, and computer animation. We provide the necessary background information and give numerous motivating examples so that no specialized knowledge is required. However, the students should have a solid mathematical background. The lecture is accompanied by readings from textbooks or the research literature. Furthermore, the students are encouraged to experiment with the presented algorithms using MATLAB.

4 Course material

- Textbook:
  Meinard Müller
  Information Retrieval for Music and Motion
  Springer
- Course slides
- MATLAB source code
- Further material will be announced and issued later

5 Examinations

Probably oral examinations (depending on the number of students) at the end of the semester (17.07.2008).

6 Schedule

1. **(17.04.):** Overview [Chapter 1]
2. **(24.04.):** Music Representations (Partitur, Audio, MIDI) [Section 2.1]
— **(01.05.):** Christi Himmelfahrt
3. **(08.05.):** Motion Representations (Andreas Baak) [Chapter 9]
4. **(15.05.):** Dynamic Time Warping (DTW) [Chapter 4]
— **(22.05.):** Frohnleichnam
5. **(29.05.):** Fourier Transform [Section 2.2]
6. **(05.06.):** Digital Filters [Section 2.3]
7. **(12.06.):** Motion Retrieval (Andreas Baak) [Chapter 10–14]
8. **(19.06.):** Features (Pitch, Chroma, CENS, MFCC) [Chapter 3]
9. **(26.06.):** Music Synchronization [Chapter 5]
10. **(03.07.):** Audio Structure Analysis [Chapter 7]
11. **(10.07.):** Summary
12. **(17.07.):** Examinations