Update on OMRAS: Online Music Recognition and Searching

Donald Byrd

CIIR, University of Massachusetts

School of Music, Indiana University

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Joint work with Tim Crawford, Matthew Dovey, and Jeremy Pickens

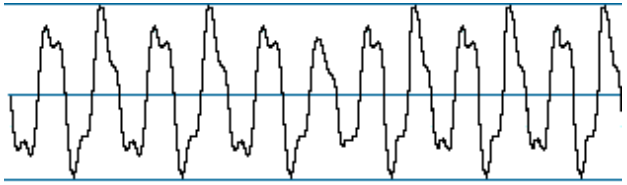
Overview

1. Background and Review
2. OMRAS/UMass Research: CMN Searching
3. OMRAS/KCL Research
4. Dissemination: ISMIR
5. Dissemination: Music-IR Book
5. Conclusions

Review: OMRAS and the Basic Representations

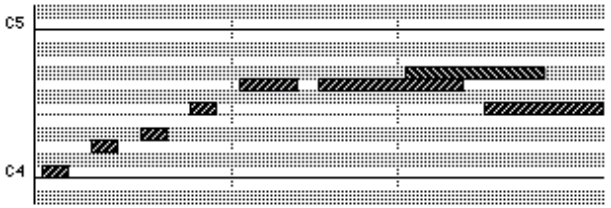
Work on all three representations:

Audio (e.g., CD, MP3) : like speech



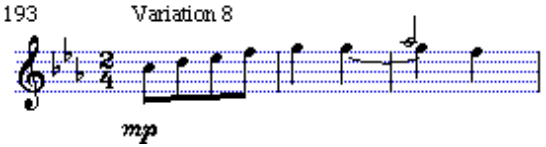
Infrastructure now

Time-stamped Events (e.g., MIDI file) : like unformatted text



Now (JMS)

Music Notation: like text with complex formatting



Now (Nightingale Search)

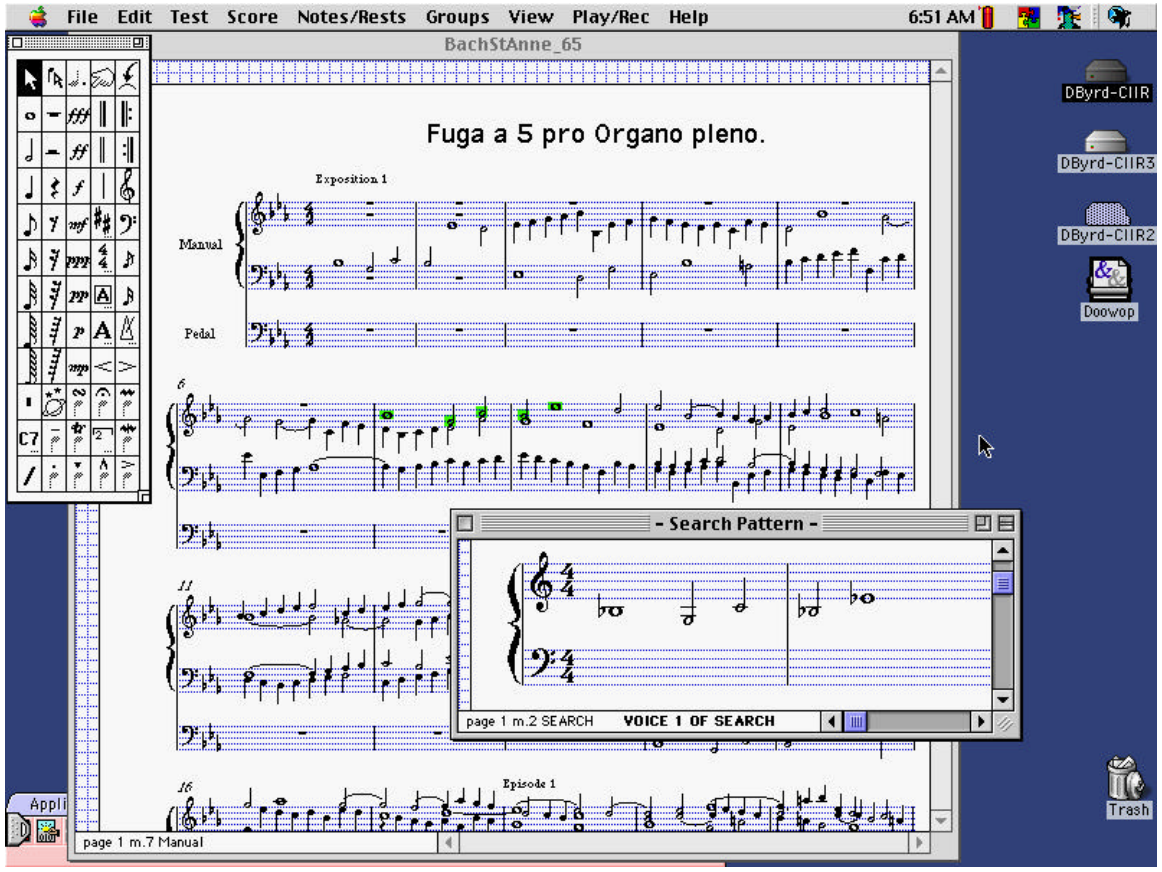
OMRAS/UMass Research: CMN Searching

- Conventional Music Notation (CMN) is
  - Very successful and useful to *many* people, but...
  - Specialized: useless to *most*
  - Very complex
- Why so little work on CMN searching?
  - Specialized; complex; lack of test collections
- But prospects for solving problems are good
- Multiple representations in music-IR systems
- OMRAS goal: search all three representations from query in any representation
  - "Cross-representation" IR

NightingaleSearch 1

- Nightingale® is high-end commercial music editor
- Full GUI for complex music notation
- NightingaleSearch inherits all normal functionality of Nightingale
- Searching commands use “Search Pattern” score as query
- Menu commands “Search for Notes/Rests” and “Search in Files” bring up dialog
- Does passage-level retrieval

Bach: “St. Anne” Fugue, with Search Pattern



NightingaleSearch 2

- A harder example: user looking in a digital music library for “Twinkle, Twinkle, Little Star”
- Results with a tiny personal library:

1: BaaBaaBlackSheep: m.1, voice 1 of Unnamed
2: BaaBaaBlackSheep: m.9, voice 1 of Unnamed
3: Mozart-TwinkleVar_10: m.1 (Theme), voice 1 of Piano
4: Mozart-TwinkleVar_10: m.84 (Variation 9), voice 2 of Piano
5: Suzuki-TwinkleVar: m.16 (Variation D), voice 1 of Violin
6: Suzuki-TwinkleVar: m.21 (Theme), voice 1 of Violin
7: Suzuki-TwinkleVar: m.29 (Theme), voice 1 of Violin
8: Twinkle-Hirsch2ndGraderVer: m.1, voice 1 of Unnamed
9: Twinkle-Hirsch2ndGraderVer: m.9, voice 1 of Unnamed
10: TwinkleHARMONETVar: m.1, voice 1 of Original
11: TwinkleHARMONETVar: m.9, voice 1 of Original
12: TwinkleMelody: m.1, voice 1 of Unnamed
13: TwinkleMelody: m.9, voice 1 of Unnamed

OMRAS/KCL Research

- Adding content-based searching to traditional music-library catalog server
  - Match music part of query locally
  - Send metadata query to catalog via Z39.50
- Generalization of event-level matching
- Induction of musically-interesting patterns
- Recognition of monophonic and polyphonic audio

Dissemination: ISMIR 2000

- First International Symposium on Music Information Retrieval was very successful
- Held in Plymouth, Massachusetts, October, 2000
- Sponsored by NSF and CIIR/UMass
- Organizing Committee (mostly OMRAS)
  - Conference Chair: Donald Byrd, Univ. of Massachusetts/Amherst
  - Program Chair: J. Stephen Downie, University of Illinois at
  - Urbana-Champaign
  - Tim Crawford, Kings College London
  - W. Bruce Croft, Univ. of Massachusetts/Amherst
  - Craig Nevill-Manning, Rutgers University

Dissemination: ISMIR 2000

- Program
  - Keynote speaker was Marvin Minsky
  - Eight invited speakers
  - 32 papers submitted for 10 slots
  - Paper session
  - Lecture/recital/survey sesion
- Attendance: 88 (capacity crowd)
- Truly international: attendees from 12 countries
  - USA (59 people = 67%)
  - UK (10)
  - Germany (4)
  - Finland (3)
  - 12 people from 8 other countries

Dissemination: ISMIR 2000 Followup

- ISMIR 2001 in Bloomington, Indiana, October 15-17, 2001
  - 50 papers submitted
  - Web site: ismir2001.indiana.edu
- Planning started for ISMIR 2002: will be outside North America (probably Europe)
- Music-ir mailing list: music-ir@ircam.fr
  - now has over 300 subscribers

Dissemination: Music-IR Book

- First book on music IR
- *Current Research in Music Information Retrieval: Searching Audio, MIDI, and Notation*
- Papers from the First International Symposium on Music Information Retrieval
- Edited by OMRAS leaders Donald Byrd and Tim Crawford, and J. Stephen Downie
- Series Editor: W. Bruce Croft
- To be published by Kluwer Academic, 2001

Conclusions

- Dissemination has been major activity
- Progress on searching all three representations
- Progress on making existing digital collections more accessible
  - OMRAS/UMass moving to Indiana University
  - => stronger ties to major DML project
  - OMRAS/KCL Z39.50 searching and connections with Oxford
- Still needed
  - Integration of UMass and KCL tools
  - “Indexing” to allow scaling up to real-world use
  - Testbed for evaluation