Development of an adaptive optical music recognition system within a large-scale digitization project

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Outline

• Lester S. Levy Collection

• Digital Workflow Management

• Adaptive Optical Music Recognition

• Current Development
Lester S. Levy Collection

• American Sheet Music (1780–1960)

• Digitized 29,000 pieces (including “The Star-Spangled Banner” and “Yankee Doodle”)

• Database of text index records, images of the music and lyrics and colour images of the cover sheets: http://levysheetmusic.mse.jhu.edu
Digital Workflow Management

• Reduce the manual intervention for large-scale digitization projects
• Creation of data repository (text, image, sound)
• XML-based metadata
  ♦ composer, lyricist, arranger, performer, artist, engraver, lithographer, dedicatee, and publisher
  ♦ cross-references for various forms of names, pseudonyms
  ♦ authoritative versions of names and subject terms
• Search engines
• Analysis toolkit
Adaptive Optical Music Recognition

• Staff recognition and removal
  ♦ Run-length coding
  ♦ Projections

• Lyric removal

• Exemplar-based learning system

• Score reconstruction
Exemplar-based learning system

• Connected-component analysis
• Feature extraction
• k-nearest neighbour classifier
• Weighted-Euclidean distance measure
• Genetic algorithm
Current Development

- Interactive graphic score editor
- Prolog-based score reconstruction
- Optical Character Recognition
- GUIDO output (MIDI)
- XML database
- Fuzzy lyric/melody search