Log of Current Activities and Applications

This listing of current and recent activities is intended to indicate the state and direction(s) of current research, to identify substantial bodies of data in machine-readable form, and to facilitate communications between users who may be engaged in projects that share a common focus or a common technical approach. For some readers it may make available in preliminary form information that would not be circulated in print without significant delay, while for others it may emphasize the need for interdisciplinary awareness and communication. For an exhaustive bibliography of published work in the field, one should consult Deta Davis's *Computer Applications in Music* (Los Altos, CA, 1987), which will contain more than 3,000 listings.

Our listing is organized under four main headings: (I) bibliogaphies, databases, and editions; (II) musical analysis and analytical methods; (III) general applications in musical analysis and musical information processing; and (IV) musical information processing facilities and programs of study. Placement under the first heading (I) is determined by whether the data is primarily textual or musical and whether the aim is primarily bibliographical or analytical. The second heading (II) includes those projects in musical analysis or in the study of analytical methods which focus on a specific repertory or musical objective. Harmonic, rhythmic, melodic and other kinds of analysis come under this rubric. Under the third heading (III) are grouped those activities whose main objective is to create an overall approach to the processing of musical information (data structures, representation systems, and computer procedures) or to explore defined musical relationships exhaustively (computational music theory). The final section (IV) lists integrated systems for musical information processing and programs of study oriented towards computer applications in musicology.

Occasionally the information received on a project is insufficient to insure its proper classification. Projects that involve the computer only for the purpose of text processing have not been included in the listing. For computer-based discographies and studies primarily concerned with sound synthesis, acoustics, perception, artificial intelligence, and classroom instruction, we suggest consultation of such journals as the *Computer Music Journal*, *Music Perception*, and *The Journal of Computer-Based Instruction* as well as bibliographical databases.

I. Bibliographies, Databases, and Editions

A. Bibliographies and Indices of Text

Barrell/Clavichord
Title: *Eighteenth-Century Literature for the Clavichord*
Investigator: Stephen Barrell
Place: Amsterdam
Scope: Inventory of text about and music for clavichord, with republication of the music in facsimile format
Computer (OS): Zenith 181-92 (MS DOS 3.2)

Bent/Nineteenth-Century Music Theory
Title: *Bibliography of Nineteenth-Century Music Theory*
Scope: printed sources of music theory, 1750-1910
Investigator: Ian Bent
Place: Cripps Computer Centre, Nottingham University
Time: 1982--
Computer: ICL 2988
Software: FAMULUS and FAMULUS 77
Associated Literature: "The 'Compositional Process' in Music Theory, 1713-1850," *Music Analysis* **III** (1984), 29-55

Crawford/Renaissance Liturgy
Title: *Renaissance Liturgical Imprints: A Census*
Scope: creation of a database for books printed between 1450 and 1565 [2500 records to date; 7500 records anticipated]
Investigator: David Crawford
Associate: James Borders
Place: University of Michigan
Time: *c.*1983--
Computer: IBM 3090
Database software: SPIRES

Duggan/Incunabula
Title: *Italian Music Incunabula: Printers and Types* [Berkeley: UC Press, 1988]
Scope: descriptive bibliography of books printed before 1501 with music or space for music
Investigator: Mary Kay Duggan
Place: UC Berkeley
Computer (OS): VAX (Unix)
Associated Literature: "A System for Describing Fifteenth-Century Music Type," *Gutenberg-Jahrbuch* (1984), 67.

Malm/Stearns Collection
Title: *The Stearns Collection of Musical Instruments: A Catalogue* [Vol. I in press]
Scope: lists 2,000 musical instruments
Head of project: William Malm
Associate: James Borders
Place: University of Michigan
Database software: SPIRES

Mercer/Grove
Title: Index to the *New Grove Dictionary of Music and Musicians*
Scope: a traditional comprehensive index of the complete work; output conforms to the British Standard for Indexes
Head of project: David Mercer
Associate: Stephen Lansdown
Place: Tasmania
Time: completion anticipated late in 1988
Computer (OS): NEC APC III (MS DOS)
Software: custom

B. Bibliographies and Indices of Music

Baron/French Airs
Title: *Inventory of French Air Collections*
Scope: listing and identification of duplicate melodies
Investigator: John Baron
Place: Tulane University

Bernskiöld/Swedish Unison Song
Title: *Unison song in the labour, temperance and revivalist movements in Sweden, 1850-1920*
Purpose: a stylistic analysis of the music with particular emphasis on the creative interaction between different socio-cultural forms of expression; 4500 melodic incipits and 9000 texts are involved
Investigator: Hans Bernskiöld (started by Inger Selander)
Computer: IBM PC AT (PC-DOS)
Software: custom

Bernstein/Scotto
Title: *A Catalogue of the Music Published by Girolamo Scotto*
Scope: 1,000 pages of information
Head of project: Jane Bernstein
Place: Tufts University
Computer: DEC VAX
Associated Literature: "The Burning Salamander: Assigning a Printer to Some Sixteenth-Century Music Prints," *Notes* 42/3 (1986), 483-501

Christenson/Shaker Tune Index
Title: *Music of the Shakers from Union Village, Ohio: A Repertory Study and Tune Index of the Manuscripts (1840-50)*
Purpose: to create an alphabetical tune index of the contents of eleven manuscripts
Investigator: Donald E. Christenson
Advisor: Keith Mixter
Place: Ohio State University
Time: 1986-8
Computer: Apple Macintosh
Encoding: Plaine and Easie code

ClinkscaleE/16th-Century Incipits
Title: *Sixteenth-Century Répertoire*
Scope: database of pitch incipits of all sixteenth-century printed music
Investigator: Edward Clinkscale
Place: University of California, Riverside
Computer: IBM PC AT
Encoding: numerical
Database software: Rbase 5000

Davis/Concertos
Title: *A Thematic Identifier Catalogue of Eighteenth-Century Concertos*
Scope: comprehensive index of the standard repertory
Investigator: Elizabeth Davis
Place: New York University
Computer: Cyber 170
Encoding: MUSTRAN

Floyd/CBMR Database
Title: *CBMR Database: A Union Catalog of Black Music Holdings in Chicago-Area Libraries*
Purpose: to provide an integrated reference system for books, recordings, sheet music, manuscripts, and photographs relating to black music
Head of project: Samuel A. Floyd, Jr.
Associates: Marsha J. Reisser, Edward Mannye, Virginia McLaurin, Diane Raptosh
Place: Center for Black Music Research, Columbia College, Chicago
Time: 1985--
Computer (OS): Texas Instr. Business Pro (MS DOS)
Software: custom

HillG/Historical Editions
Title: *A Guide to Music in Collected Editions, Historical Sets, and Monuments*
Aim: to provide an index to the contents and a complete bibliography of the editions previously covered in Heyer's book; musical incipits are encoded if titles are ambiguous [see Illustration]
Head of project: George R. Hill
Associate director: Barbara Renton
Collaborators: Garrett Bowles, Robert Falck, Irving Godt, Richard Jones, Sterling Murray, Gordon Rowley, Norris Stephens, Eric Western (software)
Place: City University of New York (with support from NEH)
Time: 1986-8
Computer: various microcomputers
Musical encoding: custom (Garrett Bowles); see Illustration #49

Kennedy/Burgundian Chanson Index
Title: *Six Chansonniers: A Study of the Central Repertory of the Burgundian Chanson*
Purpose: to make available an index (pitch only) of the chansons found in six extant Franco-Burgundian chansonniers
Investigator: Duff Kennedy
Place: UC Santa Barbara (Ph.D. thesis in progress)
Computer: Tandy 1000; IBM PC
Software: modified version of Hughes' chant code with dBase III

LaRue/Symphonies
Title: *A Catalogue of Eighteenth-Century Symphonies*: Vol I. *IDENTIFIER* [in press, Indiana University Press]
Scope: identification and source files for all known symphonies from *c.* 1720 to *c.* 1810
Head of project: Jan LaRue
Assistants: Kathryn Shanks, David Cannata
Place: New York University
Time: 1982--
Computer(OS): Cyber 180 (NOS)
Encoding: MUSTRAN

Lewis/Gardano
Title: *Antonio Gardano, Venetian Music Printer, 1538-69: A Descriptive Bibliography*, 4 vols., NY: Garland, 1987
Scope: comprehensive study of 442 editions
Head of project: Mary Lewis
Place: Brown University
Time: 1983--87
Computer: Apple Macintosh, LaserWriter
Software: Professional Composer
Associated Literature: "Zarlino's Theories of Text Underlay as Illustrated in his Motet Book of 1549," *Notes* **42**/2 (1985), 239-267

Lincoln/Madrigal
Title: *The Italian Madrigal and Related Repertories: Indexes to Printed Collections, 1500-1600* [Yale University Press, 1988]
Scope: 34,000 melodic incipits representing a repertory of 6000 works (madrigals, frottole, laude, and related genres); incipits of all voices are given)
Head of project: Harry B. Lincoln
Place: SUNY Binghamton
Hardware: IBM 3090 (data); Nicolet Zeta plotter (music printing)
Encoding: DARMS
Software: custom, in PL/1 and PASCAL
Associated Literature: "A Description of the Database in Italian Secular Polyphony held at SUNY Binghamton, N.Y.," *Fontes Artis Musicae* **XXXI**/3 (1984); sample of music printing in 1986 *Directory*

Lospinoso/Shape-Notes
Title: *American Shape-Note Tunes*
Scope: indexing of repertory, 1800-1865
Heads of Project: Margaret Lospinoso and Martin Dillon
Place: University of North Carolina
Encoding: DARMS
Associated Literature: "American Shape-Note Tunes," *Perspectives in Computing* **1**/3 (1981), 40-48

McCrickard/Stradella
Title: *Alessandro Stradella: A Thematic Catalogue of His Works* [Pendragon Press, forthcoming]
Scope: listing of textual and musical incipits of 300 works, based on a survey of 1000 sources
Heads of project: Eleanor McCrickard and Carolyn Gianturco
Place: UNC at Greensboro
Computer: Apple II
Software: Quick File (data entry), Apple Writer (editing)

Morehen/Anglican Church Music
Title: *A Thematic Index of Anonymous English Church Music*
Scope: all English church music from the Reformation to the Civil War (1550-1640)
Head of project: John Morehen
Place: Cripps Computing Centre, Nottingham University
Time: 1981--
Hardware: ICL 2988; Benson plotter
Software: DARMS encoding with FORTRAN77 and GHOST
Associated Literature: "Thematic Indexing by Plotter from DARMS Input," *Proceedings of the Second International Symposium on Computers and Musicology, Orsay, 1981* (Paris, CNRS, 1983), 31-42; "Thematic Cataloguing by Computer," *Fontes Artis Musicae* **XXXI**/1 (1984), 32-38

Morosan/Russian Choral Music
Title: *Russian Sacred Choral Music: An Encyclopedic Thematic Catalog*
Aim: to compile and cross-reference a published thematic catalog of some 2100 liturgical musical works from the Russian choral repertory of the 18th, 19th, and 20th centuries
Head of project: Vladimir Morosan
Place: Hamden, CT
Music printing: subcontracted to A-R Editions, Inc.

Murray/Anthologies
Title: *A Guide to Standard Anthologies of Musical Examples*
Scope: 35,000 records of information about 48 anthologies of musical examples, with index and genre codes
Head of project: Sterling Murray
Associate: Benjamin Trumbore
Place: West Chester University
Time: 1984--
Computer: Honeywell Sigma 9
Software: custom

Murray/Rosetti
Title: *Thematic Index to the Music of Antonio Rosetti (1750-92)*
Investigator: Sterling Murray

National Tune Index/Overview
Title: *National Tune Index*
Purpose: to create a series of indices of secular music repertories from the 16th to the 20th centuries; completed projects published in microfiche [see following listings]; includes indices of text, scale degrees (numerical representation), interval sequence, stressed notes, and sources
Originator: Kate Van Winkle Keller
Associated Literature: Gustave and Carolyn Rabson, "The National Tune Index: A Systems Overview," *Computers and the Humanities* **15**(1981), 129-137; same authors, "Hum a Few Bars," *Perspectives in Computing* [an IBM publication] **5**/1 (Spring 1985)

National Tune Index/Eighteenth-Century Secular Music
Title: *National Tune Index: Eighteenth-Century Secular Music*
Scope: listings and concordances of 38,000 secular tunes, songs, and dances of the eighteenth century in American, Canadian, and British sources
Heads of project: Kate Van Winkle Keller and Carolyn Rabson
Sponsor: compiled under the auspices of the Sonneck Society with support from the National Endowment for the Humanities; data stored at Clarkson University (Potsdam, N Y)
Time: 1976-80
Software: modified DARMS [musical material in numerical format] with SPITBOL
Associated Literature: the complete index is published in microfiche (New York: University Music Editions, 1980) with a *User's Guide* by the co-directors

National Tune Index/American MSS
Title: *National Tune Index: Eighteenth-Century Popular Secular Music in America in Manuscript*
Scope: based on sources already indexed in the above compilation
Head of project: Kate Van Winkle Keller
Place: Radnor, PA
Time: in progress

National Tune Index/American Songsters
Title: *National Tune Index: American Songsters to 1820*
Scope: index of titles, first lines, burden and chorus lines, and melodic incipits based on Irving Lowen's bibliography
Heads of project: Arthur F. Schrader and Kate Van Winkle Keller
Place: Radnor, PA
Time: in progress

National Tune Index/English Folk Song
Title: *National Tune Index: English Language Traditional Folk Song*
Scope: similar to that of above projects
Head of project: Anthony Barrand
Place: Boston University
Time: in progress

National Tune Index/Wind Band Music
Title: *National Tune Index: Early American Wind and Ceremonial Music, 1636-1836*
Scope: a listing and concordance of eighteenth-century wind music in American, Canadian, British, French, and British libraries
Head of project: Raoul Camus
Place: CUNY--Queensborough (with support from NEH)
Time: 1987
Publication: microfiche binder with printed contents guide (University Music Editions, 1987)

PowersD/Troubadour Songs
Title: *Troubadour Songs*
Purposes: to create a numerical index, modelled on the Gregorian chant index of Bryden and Hughes, and to create a database of poetic and melodic analyses of songs
Investigator: Doris B. Powers
Place: Carrboro, NC

Rees/Grancino Collection
Title: *Catalogue of the Grancino Collection*
Scope: detailed listing of 8,000 works for cello (1630-1850) collected in photographic copies by Nona Pyron
Head of project: Fred Joseph Rees
Associate: Nona Pyron
Place: New York University
Time: 1984-8
Computer: DEC-10; VAX (VMS)

Selfridge-Field/Marcello
Title: *Benedetto Marcello (1686-1739): A Thematic Catalogue* [to be published by Oxford University Press]
Scope: listing of textual and musical incipits of 700 works, based on a survey of 3,000 sources, with multiple indices and source filiation
Investigator: Eleanor Selfridge-Field
Place: CCARH, Menlo Park, CA
Time: 1984-87
Hardware(OS): HP-1000 (IBYCUS); HP LaserJet II
Software: custom designed by Walter B. Hewlett

Stinson and Griffiths/Fourteenth-Century Music
Title: *Fourteenth-Century Répertoire*
Scope: comprehensive catalogue of all known repertoire of the fourteenth century (5500 items to date) including musical incipits
Heads of project: John Stinson and John Griffiths
Associate: Giovanni Carsaniga
Place: La Trobe University and Univ. of Melbourne (Australia)
Time: 1984-88
Hardware: Vax mainframes, Ericsson PC, Epson SQ-2000 (music), Houston plotter
Software: SCRIBE
Associated Recording Project: fourteenth-century music--digital recording of 200 works not previously available

Temperley/Hymn Index
Title: *Hymn Tune Index*
Scope: listing of 115,000 hymn and Psalm tunes associated with English texts (1536-1820)
Heads of project: Nicholas Temperley and Charles G. Manns
Place: University of Illinois (with support from NEH)
Time: 1982--
Hardware: IBM terminal and Cyber computer
Software: FORTRAN (numerical pitch representation)
Literature: *Fuging Tunes in the Eighteenth Century* (Detroit, 1983)

Wall/Broadway
Title: *The Music of Broadway, 1866 to Date: A Fact Book and Finding Guide*
Head of project: Richard C. Wall
Place: Queens College (with support from NEH)
Time: 1984--

C. Databases of Text

Baroni/Bolognese Libretti
Title: *Libretti of Works Performed in Bologna, 1600-1800* [Modena: Mucchi, 1987]
Scope: multiple index of authorship and performing details of published libretti for operas, oratorios, and other musical performances (4000 works) in Bologna and Emilia generally
Head of project: Mario Baroni
Associates: Gabriele Bersani Berselli, Laura Callegari, Maria Gabriella Sartini
Place: Istituto di Studi Musicali e Teatrali, Univ. of Bologna
Time: 1980-85
Hardware: Apple II (data entry); Sun 1 (printing)

Boston Dainas Project
Title: *Boston Danais Project*
Purpose: to create a database of the texts of Latvian dainas
Head of Project: Kristine Konrad

CCARH/Handel Edition Concordance
Title: *A Concordance of Complete Editions of Handel's Music*
Purpose: to facilitate location of particular editions [*Hallische Händel-Ausgabe, Händelgesellschaft*/original, *Händel-gesellschaft*/Belwin Mills] of Handel's works by HWV, opus, RISM number, key
Place: Menlo Park, CA
Compiler: Frances Bennion
Date: Phase 1 - Instrumental music, 1987

ClinkscaleM/Early Pianos
Title: *Early Pianos, 1750-1850*
Scope: comprehensive database with fields for maker, place, date, owners, etc.
Investigator: Martha Novak Clinkscale
Place: UC Riverside
Database software: R:Base V

Degrada/Neapolitan Comic Opera
Title: *Neapolitan Comic Opera Libretti, 1700-1750*
Scope: multiple indexing of performance details and text incipits of all comic operas produced in Naples from 1700 to 1750
Head of project: Francesco Degrada
Place: University of Milan
Time: 1986--
Computer: Olivetti

Griffin/Gazzetta di Napoli
Title: *Gazzetta di Napoli*
Purpose: to create an indexed database of extracts from the *Gazzetta di Napoli* (1681-1725) containing information about music (composers, performances, works) in this Napolitan weekly
Investigator: Thomas Griffin
Place: Hollister, CA
Access: CP/M discs; available by modem
Database Software: dBase II

McGuinness/Musical References in London Newspapers
Title: *A Computer Register of Musical Data in London Newspapers, 1600-1800*
Aim: to record data in its entirety and to index it in such a way as to make it useful for interdisciplinary study
Head of project: Rosamund McGuinness
Associates: Simon McVeigh, Ian Bent, Ian Spink and others

Place: Royal Holloway and Bedford New College (Univ. of London)
Time: 1987-89

Monson/Eighteenth-Century Opera Data
Title: *Database for Eighteenth-Century Italian Opera*
Scope: data concerning performance (date, theater), libretti, personnel (librettist, composer, performers), and surviving music for 15,000 opera productions cited in the Sartori libretto index and other catalogues
Head of project: Dale Monson
Place: University of Michigan (Michigan Terminal Service)
Time: initiated 1984 [discontinued, 1987]
Computer: Amdahl 5860
Database software: TAXIR

Monson/Singer Index
Title: *Index of Singers in Eighteenth-Century Italian Opera*
Scope: a subset of data derived from the project listed above
Investigator: Dale Monson
Computer: Zenith 158
Database software: dBASE III

Illustration 49

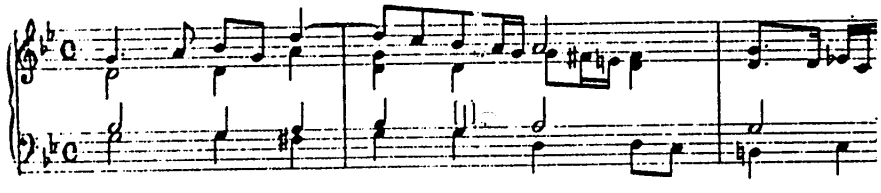
Databases of Text -- 1

George Hill *et al.* List of fields available in record.

[The purposes of this large collaborative project is to create an upgraded version of the Heyer catalogue of music in collected sets and monumental editions.]

1. Start-of-record marker
2. Serial number
3. Name of composer
4. Uniform title
5. Additional titles
6. Opus and thematic catalogue numbers
7. Authority thematic catalogue number
8. Format
9. Non-standard clefs
10. Figured bass
11. Duration
12. Editor
13. Language of text
14. Librettist
15. Genre
16. Text incipit
17. Musical incipit
18. Instrumentation
19. Practical editions
20. Notes
21. Source
22. Date and initials of encoder
23. Date and initials of senior editor
24. Date and initials of project directors
25. End-of-record marker

Field 17 accepts encoded music. Garrett Bowles' code for the top voice of the Piper's Pavan by John Dowland is shown with the music in the following example.



```
>MI G2/2F/TC/4.G4/8A/B/G/4D5+8/C/B4/16A/G/2A/8.G/16D/EF/C/
```

Illustration 50

Databases of Text -- 2

Charles Mould. List of fields available in record.

[The purpose of this project is to provide an ongoing database of information concerning 1500 surviving harpischords and clavichords. The information was originally assembled to facilitate revisions to the second edition of the Boalch catalogue.]

1. Name of collection
2. Catalogue or accession number
3. Last name of maker
4. First name of maker
5. Middle name of maker
6. Date of manufacture
7. Place of manufacture
8. Type of instrument
9. Remarks on fields 1--8
10. Number of manuals
11. Types of stops
12. Special features of manuals, stops
13. Compass
14. Short or broken octave information
15. Key covering
16. Case finish
17. Number of roses
18. Style of rose
19. Initials in rose
20. Case construction
21. Remarks on fields 10--20
22. Scale length (mm)
23. Case length
24. Case width
25. Case depth
26. Inscriptions
27. Former owners
28. Location of illustrations
29. Security restrictions
30. Number in Boalch, 2nd edition
31. Number in Boalch, 3rd editions
32. Remarks on fields 22--31

Illustration 51

Databases of Text -- 3

Berkeley/Ferrara Madrigal Project. List of fields.

[This very large database project seeks to meet several objectives including cataloguing, analysis of both text and music, and reconstruction of lost items. The following list of fields is in use in the pilot phase of the project. Fields marked here with a colon are repeatable. Therefore, the exact number of fields for any given record is variable. These fields are used in a SPIRES database.]

1. System-supplied record number
2. Title of work as given in original source
3. Uniform title of work
4. RLIN catalogue record identification (MARC compatible)
5. Composer(s):
   a. Name
   b. Profession
   c. City of activity
   d. Institution
6. Author(s):
   a. Name
   b. Profession
   c. City of activity
   d. Institution
7. Editor(s):
   a. Name
   b. Location
8. Printer(s):
   a. Printer, name
   b. Printer, location
   c. Publisher, name
   d. Publisher, location
   e. Bookseller, name
   f. Bookseller, location
9. Year of publication
10. Names of partbooks
11. Page format
12. Pagination

13. Dedicatee(s)
    a. Name(s)
    b. Title(s)
    c. Text Quotations
    d. Signature of dedication
    e. Names in text of dedication
    f. Date of dedication
    g. Place of dedication
14. Cross-reference to Library of Congress name authority file
15. Preface:
    a. Date
    b. Signature
16. Modern edition(s):
    a. Title
    b. Place
    c. Name of publisher
    d. Date
17. Indexes in volume (may be by name of poet, kind of poem, title)
18. Colophon information
19. RISM number
20. Vogel catalogue number
21. Errata listed in original source
22. Record of SPIRES operations already carried out
23. Location of copies:
    a. Library name
    b. Place
    c. Call number
    d. Edition
24. Notes:
    a. Date
    b. Text
    c. Author
25. Entry data
    a. Name of inputter
    b. Date
26. Maintenance data:
    a. Nature of alteration to any field
    b. Date of change

Illustration 52

Databases of Text -- 4

RENARC. Sample of retrievable information.

RENARC is a databank of information about Renaissance musicians. It is maintained at Columbia University. The first three windows in the illustrations show display of (1) the archival source, (2) details of the circumstances surrounding the document and a summary of its contents, and (3) a list of names mentioned in the document. The remaining windows are used for commands.

```
                          RENARC DOCUMENT NO. 2

SOURCE:  (1548) LILLE: ARCH NAT 4G 6798 (1548-49), 8
--------------------------------------------------------------------------------
CITY:    CAMBRAI              RULER:                 INSTITUTION:   CATH
YEAR:    1548                 ARCHIVE: LAN           SUBMITTED BY:  CWW
SUMMARY: PRO GRATIA FACTA PER DOMINOS CAPITULARES CIRCA FESTUM SANCTORUM
         OMNIUM (1548) VIGINTI TRIBUS VICARIUS VIDELICET DOMINO (SEE LIST)
         ET MISGTRO PUERORUM CUILIBET XXX S. SUNT SIMUL XXXIIIJ LB. XS.

--------------------------------------------------------------------------------
  1) JO DE PUTEO            2) JO REIGNERJ            3) JO PREPOSITI
  4) FRANCISCO BOULIC       5) MICHAELI LIBERT        6) RO BELHOST
  7) JO DE DERY             8) CRUSTA JUVENIS         9) JO SELLIER
 10) ANTHO. BOUCHIER       11) MARRO MERCHANT        12) ROBERTO OGIER
 13) PHILIPPE DE MONTE     14) OLIVIERO WYON         15) (MORE...)
================================================================================
 D  Document               +  Show More              O  Off
 N  Name                   R  Re-Display             E  Edit
 L  List Names             Q  Query                  ?  Help

--------------------------------------------------------------------------------
COMMAND?.
```

```
                          RENARC DOCUMENT NO. 2

SOURCE:  (1548) LILLE: ARCH NAT 4G 6798 (1548-49), 8
--------------------------------------------------------------------------------
CITY:    CAMBRAI              RULER:                 INSTITUTION:   CATH
YEAR:    1548                 ARCHIVE: LAN           SUBMITTED BY:  CWW
SUMMARY: PRO GRATIA FACTA PER DOMINOS CAPITULARES CIRCA FESTUM SANCTORUM
         OMNIUM (1548) VIGINTI TRIBUS VICARIUS VIDELICET DOMINO (SEE LIST)
         ET MISGTRO PUERORUM CUILIBET XXX S. SUNT SIMUL XXXIIIJ LB. XS.

--------------------------------------------------------------------------------
 13) PHILIPPE DE MONTE     14) OLIVIERO WYON         15) JO ROUSSEL
 16) PIETRO BERTO          17) NICO. QUILLIART       18) JACOBUS DE KERLE
 19) JO SLAPPEN            20) BENEDICTO DARRAS      21) NICO. LENGLEZ
 22) ADRIANO POOTRE
================================================================================
 D  Document               +  Show More              O  Off
 N  Name                   R  Re-Display             E  Edit
 L  List Names             Q  Query                  ?  Help

--------------------------------------------------------------------------------
COMMAND?.+
```

Mould/Harpsichord

Title: *Makers of the Harpsichord and Clavichord, 1440-1840* [3rd edn. of the 1956 study by D. H. Boalch; forthcoming from Oxford University Press]

Scope: revised version of original work to be supplemented by an online database concerning the instruments themselves; a hardcopy version of the latter information is also anticipated; this survey includes roughly 1500 harpsichords and clavichords; 32 searchable fields include details of compass, manuals, materials, decorations, and dimensions; offers many points of access to information about unsigned instruments [see Illustration #50]

Investigator: Charles Mould

Place: Bodleian Library, Oxford University

Date of Completion: Summer 1989

Computer: IBM PC compatibles

Database software: dBase III

Perry-Camp/Mozart

Title: *Non-musical Markings in Mozart Autograph MSS*

Scope: a complete compilation of data (330 MSS to date) and correlations with musical, biographical, and textual events to ascertain the sources and functions of the markings

Investigator: Jane Perry-Camp

Place: Florida State University

Computer: Cyber 730

Software: custom designed (music) with Sir II (database)

Literature: "Divers Marks in Mozart's Autograph Manuscripts: Census and Significance," *Mozart-Jahrbuch 1984/85*

Perkins/RENARC [=Renaissance Archive]

Title: *Repository of Archival References... concerning Music and Musicians in the Renaissance*

Scope: a multiple index of personnel information (names, dates, occupations) also citing the location and provenance of the document and the person contributing the information (six fields in all); see Illustration #52

Head of project: Leeman Perkins

Associates: Brian Stierup (software); Lewis Lockwood, Jeremy Noble, Richard Sherr, Craig Wright *et al.*

Place: Columbia University, Center for Computing Activities

Computer: IBM 3083B

Software: custom, in PL/1

Access: under review

UCB *et al.*/Italian Lyric Poetry

Title: *Italian Music and Lyric Poetry of the Renaissance*

Scope: full-text transcriptions of Italian lyric poetry and associated music from *c.* 1450 to 1650, and a bibliographical record of the sources; view toward exploration of *topoi* in the texts and thematic families in the instrumental music [see Illustration #51]

Associates: Michael Keller (Yale), Anthony Newcomb (UCB); Thomas Walker (U. of Ferrara); five Italian literature specialists including Louise Clubb (UCB and Villa I Tatti)

Locations: UC Berkeley, Pisa, Ferrara, Rome and elsewhere

Time: 1985-95

Computers: IBM PC ATs (all points) electronically linked

Database software (text): SPIRES [see illustration]

Encoding: custom

Access: RLIN (bibliographical data)

Vassalli et al./Madrigal Poetry

Title: *Indagine sulla poesia per musica (1530-1630)*

Purpose: to identify authors of poems set to music [related to the preceding listing]

Investigators: Antonio Vassalli, Lorenzo Bianconi, Angelo Pompilio

Place: Istituto di Studi Rinascimentali, Ferrara

D. Databases and Editions of Music

CCARH/Bach
Title: *The Complete Works of J. S. Bach*
Aim: creation of a database designed to permit extensive, rapid music retrieval and analysis; most works for harpsichord and for orchestra, as well as some works for organ, two passions and the B-Minor Mass are currently stored
Place: Menlo Park, CA
Computer(OS): HP-1000 (IBYCUS)
Software: custom designed by Walter Hewlett
Associated Literature: Walter B. Hewlett, "A System for Numeric Representation of Musical Pitch" [forthcoming; see below]

CCARH/Corelli
Title: *The Complete Works of Arcangelo Corelli*
Aim: creation of a database designed to permit extensive, rapid musical analysis; multiple versions from encoding of early editions
Place: Menlo Park, CA
Computer(OS): HP-1000 (IBYCUS)
Software: custom designed by Walter Hewlett

Charnassé/German Lute Tablature
Title: *Transcription automatique de tablatures de luth allemandes*
Purpose: systematic transcription of sixteenth-century lute manuscripts in diverse tablatures, with extensive consideration of specific musical traits and a printing capability for both the music and its analysis
Investigators: Hélène Charnassé, Bernard Stépien
Place: CNRS, Paris
Computer: IBM PC
Encoding: TABINT (Interactive Tablature Encoding)
Internal representation: numerical
Software (printing): LUTH
Associated literature: "Automatic Transcription of Sixteenth Century Musical Notations," *Computers and the Humanities* 20 (1986), 179; "Transcription of XVIth Century Lute Tablatures," *Advances in Computing and the Humanities*, forthcoming

CNUCE Library
Title: *A Library of Encoded Music*
Scope: currently, about 800 works by such composers as Frescobaldi, Bach, Handel, Mozart, Beethoven, Paganini, Brahms, Verdi, Wagner, Joplin, and Boulez; the encoded data is available for playback, analysis, and processing
Head of project: Pietro Grossi
Places: Pisa (CNUCE) and Florence (Conservatory)
Encoding and software: TELETAU
Email access: *cheru@ifiidg.bitnet*

Houghton/Chigi Codex
Title: *Critical Edition of the Chigi Codex*
Scope: transcription and commentary on the polyphonic repertory in Bibl. Vaticana C.VIII.23X (c.1470-1515)
Head of project: Edward F. Houghton (UC Santa Cruz)
Associate: Herbert Kellman (Univ. of Illinois)
Computer and software: diverse

Duffin/Dufay
Title: *Forty-Five Dufay Chansons from Canonici 213*
Scope: a performing edition in white mensural notation
Investigator: Ross Duffin
Place: Stanford University
Time: completed in 1977 (D.M.A. thesis)
Computer: DEC PDP-10, Versatec plotter
Software: SCORE [illustration in the 1986 *Directory*]

Hughes/Rhymed Offices
Title: *Late Medieval Rhymed Offices*
Scope: thousands of manuscripts and ten printed volumes of text relating to repertory from the tenth through the sixteenth centuries; the objective is to analyze this collection of chants
Investigator: Andrew Hughes
Place: University of Toronto
Time: 1974--
Computer: various S100 Z-80 machines
Software: custom designed encoding system to handle square and Gothic plainchant notation (numerals for pitch; letters for notation)

Hughson et al./Folk Song Analysis
Title: *The Computerization of Folk Song Analysis*
Objective: to specify a system capable of analysis and classification of folk music using the methods of the Kodaly Institute of Canada, including the ability (1) to reduce the time required for these activities, (2) to classify music consistently and accurately, and (3) to provide a more efficient means of storing and transmitting this information
Head of project: M. E. Jernigan
Reporting for project: Mary Hughson
Other researchers: Anita Gatti, Bill Van Hout, Mary Hughson
Place: University of Waterloo [Canada] Dept. of Engineering
Computer: IBM PC (compatible)
Software (data entry): Personal Composer
Software (storage and analysis): under development
Associated Literature: *Final Report: Computerization of Folk Song Analysis; SD 262* (December 1, 1986); available through the Dept. of Systems Design Engineering, University of Waterloo (Ontario)

Hultberg/Spanish Tablature
Aims: to implement the tablature-to-standard-notation transcription process developed earlier for larger systems on a Macintosh; conversion capabilities can deal with Spanish, Italian, English, French, and German styles of tablature; thematic indices of Spanish sources are in preparation
Head of project: Warren Hultberg
Associate: Mary Lou Hultberg
Place: SUNY Potsdam
Computer: Macintosh 512
Software: BASIC, PASCAL
Encoding: modified DARMS
Music printing: Professional Composer
Literature: "Data Bases for the Study of Relationships among Spanish Music Sources of the 16th-17th Centuries," *Fontes Artis Musicae* **XXXI**/3 (1984); edition of Diego Pisador's *Libro de musica de vihuela [Salamanca, 1552]* in the report of the *Congresso Internacional "Espana en la Musica de Occidente"* (Salamanca, 1985)

Morosan/Russian Sacred Music
Title: *Monuments of Russian Sacred Music*
Aim: preparation of a 40-volume edition to commemorate the millenium of Christianity in Russia (1988); choral repertory by major Russian composers with full annotation, transliteration, etc.
Head of project: Vladimir Morosan
Associatets: Nicolas Schidlovsky, Olga Dolskaya-Ackerly, Peter Jermihov, Alexander Ruggieri, Gerald Seaman
Place: Hamden, CT
Computer (entry): Apple Macintosh
Computer (printing): Linotronics 100 typesetter (with 'Sonata' font)
Software: Deluxe Music Construction Set; Laser Cyrillic

NewcombA/Italian Instrumental Music
Title: *Italian Instrumental Music in the Renaissance*
Purpose: related to the Italian Lyric Poetry project described under Databases of Text, the aim of this project is to identify thematically related families of works
Head of project: Anthony Newcomb
Place: UC Berkeley

O'Maidin/Irish Music
Title: *Database for Retrieval and Analysis of Irish Music*
Scope: development of software for input, editing, analysis
Head of project: Donncha O'Maidin
Place: Waterford Regional Technical College (Eire)
Time: 1986--
Hardware: DEC VAX-11/780, BBC micro, Epson FX-100, C.ITOH Cl-600Q
Software: ALMA (encoding), custom (analysis), SMUT (printing)
Associated Literature: "A Computer System for Music Analyses," *Proceedings of the Conference on Music and the Computer 1984* (forthcoming, Paris, Eratto)

Perkins/Busnois
Title: *The Complete Secular Works of Antoine Busnois*
Scope: a facsimile score is produced by computer, which then makes a detailed comparison of the sources for each work and lists the variants according to type; this data appears in the critical report
Head of project: Leeman Perkins
Place: Columbia University
Hardware: IBM 3083BX; Gould plotter
Encoding: FASTCODE (adapted by Frank Esposito)
Software: SPITBOL
Associated Literature: *Newsletter* of the Columbia University Center of Computing Activities, **XIII**/13 (Sept. 23, 1981)

PowersH/Lassus
Title: *The Motets of Lassus and Susato*
Scope: storage, analysis, and editing of 278 motets by Lassus and 250 by Susato
Head of project: Harold Powers (Princeton)
Associate: Lawrence Earp (Wisconsin)
Computer: IBM 3033
Encoding: FASTCODE
Software: MIR (retrieval) with SPITBOL
Literature: "Tonal Types and Modal Categories in Renaissance Polyphony," *Journal of the American Musicological Association* **XXXIV** (1981)

SmithDA/Weiss
Title: *Silvius Leopold Weiss: Complete Works for Lute*
Scope: preparation of 10 volumes of music both in a computer-generated "facsimile" of the original tablature and in modern edition for publication in *Das Erbe deutscher Musik*; more than 80 works (roughly 700 movements) are involved
Head of project: Douglas Alton Smith
Associate: David Fitzpatrick
Place: CCRMA, Stanford University
Time: 1983--
Computer (data entry): Commodore-64
Computer (editing and page makeup): PDP-10
Printing device: Versatec plotter
Encoding: SCORE/MS
Software: SCORE/MS; custom facsimile font [illustrated in the 1986 *Directory*]

Wade *et al*/C. P. E. Bach
Title: *The Carl Philipp Emanuel Bach Edition*
Aim: the publication of the complete works of the composer in a critical edition [supported by NEH]
Head of project: Rachel Wade
Associates: Eugene Helm (with roughly 20 editors)
Place: University of Maryland

Time: 1983-2008
Computer (data entry): IBM PC
Printing devices: Epson FX-80 (draft); Gould plotter 6320 (final)
Software: Oxford Music Processor

Associated Literature: Gary A. Greene, "Report from the University of Maryland at College Park," *Current Musicology*, **37/38** (1984), 280

E. Textual Analysis

Boroda/Text Repetition
Title: "Principles of the Organization of Repetitions on the Micro-level of the Musical Text," doctoral dissertation [in Russian], Tbilisi, 1979
Investigator: Moisei Boroda
Place: Tbilisi

Christie/Greek Poetry
Title: *Conversion of the Ancient Greek Poetic Meter from Euripides's* **The Bacchae** *into Digitially Produced Sound*
Investigator: George Christie
Places: Uranus Studio (Wilmington) and Northern Illinois Univ.
Hardware: PDP 11/04 (RT-11); IBM PC; Epson LQ-800; Buchla synthesizer

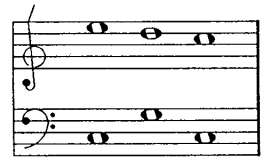
Grijp/Contrafacta
Title: "Footbank: A Method of Finding Melodies by Text Association" [in Dutch], *Tijdschrift van de...Ned. Muziek-deschiedenis* XXXIV/1 (1984), 26-48
Scope: using the poetry of P.C. Hooft (1613), a search for contrafacta in 16th-18th century Dutch song was conducted
Investigator: Louis Peter Grijp

HillJ/Contrafacta
Title: *Italian Contrafacta*
Aim: identification of text parodies in musical settings, 1500-1700; program counts the number of syllables in each line (accent is not analyzed); Stage 1 (arias by Vivaldi) completed in April 1986; Stage 2 (other composers) in progress
Investigator: John Hill
Place: University of Illinois
Time: 1985--
Computer: IBM PC AT
Software: Savvy - PC (analysis)

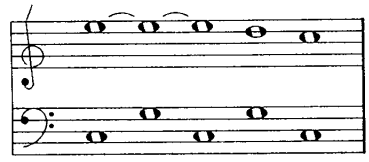
Illustration 53

Musical Analysis -- 1

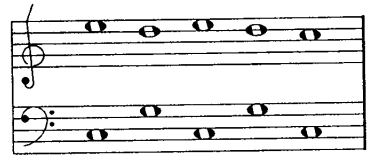
Michael Kassler: Beginning of a derivation in the explication of Schenker's middleground.



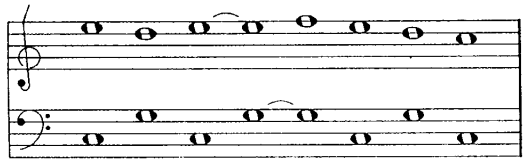
3-to-1 axiom



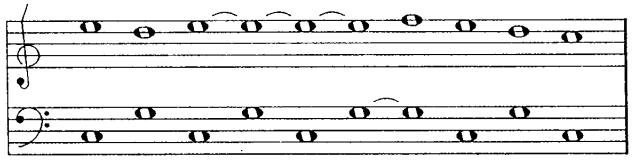
inferred from last by rule of bass arpeggiation



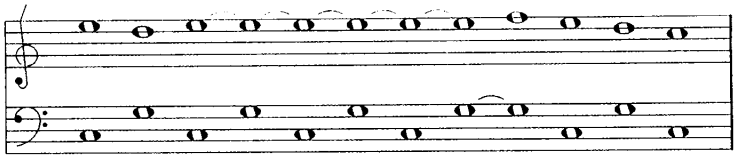
inferred from last by rule of articulation



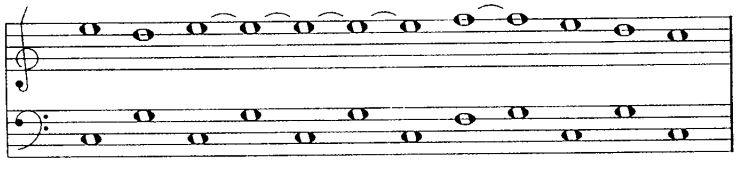
inferred from last by rule of neighbour-note prolongation



inferred from last by rule of bass arpeggiation



inferred from last by rule of bass arpeggiation



inferred from last by rule of bass ascent

Musical examples printed by Michael Kassler on a Canon LBP 8A2

II. Musical Analysis and Analytical Methods

Barbieri & Del Duca/Microtonal Performance
Title: *Renaissance and Baroque Microtonal Music Research*
Purpose: to demonstrate the microtonal tuning systems used by Vicentino (1595), Colonna (1618), Sabatini (1650), and Buliowski (1699)
Investigators: Patrizio Barbieri, Lindoro Del Duca
Hardware: IBM PC, synthesizer
Associated Literature: abstract in *ICMC Proceedings 1986*, 51

Barnes/Elgar
Title: *Computer Analysis of Romantic Orchestral Music*
Purposes: Stage 1 -- to develop an encoding system and analytical techniques suitable for this kind of music; Stage 2 -- to apply these methods to style analysis, especially of Elgar symphonies
Investigator: Roger Barnes
Place: Leicester (U.K.) Polytechnic
Time: Stage 1, complete; Stage 2, by 1990
Computer: ICL 2900
Software: SPITBOL (version 4)

Baroni/Chanson 2
Title: *Antiche canzoni francesi: uno studio di metrica generativa*
Scope: analysis of 70 French songs published in *c.* 1760; undertaken to examine the interplay of patterns of meter and accent (1) between text and music within the repertory and (2) in this repertory as contrasted with the same features in a repertory of Lutheran chorales
Head of project: Mario Baroni
Associates: Laura Callegari, Carlo Jacoboni, Rossella Brunetti
Place: University of Bologna
Time: 1981-86
Computer: Apple //
Software: custom
Associated Literature: "Antiche canzoni francesi: Uno studio di metrica generativa," *Quaderni di Informatica Musicale* 5 (1984); "A Grammar for Melody: Relationships between Melody and Harmony" in *Musical Grammars and Computer Analysis: Proceedings of the Conference [Modena...1982]* (Florence, 1984)

Baroni/Chorale Melodies
Title: *Bach Chorales*
Purpose: to deduce grammatical rules for the construction of the chorale melodies used by Bach; the newly generated melodies test the veracity of the rules so deduced
Heads of project: Mario Baroni, Carlo Jacoboni
Place: University of Bologna
Associated Literature: *Proposal for a Grammar of Melody: The Bach Chorales* (Montréal, 1978); "Computer Generation of Melodies: Further Proposals," *Computers and the Humanities* **XVII** (1983); "The Concept of Musical Grammar," *Music Analysis* **II**/2 (1983), 175-208

Baroni/Legrenzi
Title: *Legrenzi cantatas*
Purpose: investigation of the melodic features found in Legrenzi's *Cantate*, 1676
Head of project: Mario Baroni
Place: University of Bologna

Baroni/European Melody
Title: *The Study of Melody in European Music*
Purpose: to explore diverse repertories with a view toward defining concepts and working principles of melody in European culture; the three preceding projects are components
Associated Literature: "A Project of a Grammar of Melody" in *Informatique et musique: Actes du second Symposium International, Orsay 1981* (Orsay, 1983)

Bevil/Folktune Presevation
Title: *A Paradigm of Folktune Preservation and Change Within the Oral Tradition of a Southern Appalachian Community, 1916-86*
Purpose: to investigate developments within a small geographical area since Cecil Sharp's visit in 1916
Investigator: J. Marshall Bevil
Computer: Apple //c
Encoding: custom numerical encoding with stress coefficient
Associated Literature: "Scale in Southern Appalachian Folksong: A Reexamination," *College Music Symposium* **26** (1986), 77-91

Blombach/Bach Chorales
Title: *The Bach Chorales*
Scope: 150 Bach chorales queried for note and interval counts, ranges, pattern analysis, and relationships between vertical and horizontal features such as scalar contradictions and harmonic implications
Head of project: Ann K. Blombach
Place: Ohio State University
Software: Musicode A [now being redesigned for the Macintosh]
Associated Literature: "An Introductory Course in Computer-Assisted Analysis; the Computer and the Bach Chorales," *Journal of Computer-Based Instruction* 7/3 (1981), 70-77; "Harmony vs. Counterpoint in the Bach Chorales," *Computing in the Humanities*, ed. Richard W. Bailey (1982), 79-88; "An Implementation of Hewlett's Second Order [Pitch Representation] Solution on a Micro" [*JCBI*, forthcoming]

Brinkman/Melodic Process in Bach
Title: "The Melodic Process in Johann Sebastian Bach's *Orgelbüchlein*," *Music Theory Spectrum* II (1980), 46-77
Purpose: to study motivic derivation from the cantus firmus
Head of project: Alexander Brinkman
Place: Eastman School of Music (Rochester, NY)
Computer: IBM mainframe
Software: in SNOBOL 4 and PL/1
Associated Literature: "The Melodic Process in Johann Sebastian Bach's *Orgelbüchlein*: A Computer-Assisted Study of the Melodic Influence of the Cantus Firmus on the Contrapuntal Voices" (Ph.D. thesis, 1978)

Camilleri/Schubert
Title: "A Grammar of the Melodies of Schubert's Lieder" in *Musical Grammars and Computer Analysis* (Florence, 1984), 229-237
Scope: establishment of rules governing the first four notes of melodies from *Die schöne Müllerin, Die Winterreise*, and the *Schwanengesang*
Head of project: Lelio Camilleri
Place: CNUCE (Florence), Musicology Division
Software: TAUMUS

Cantor/Landini
Title: *Landini Ballate*
Scope: examination of vertical sonorities and voice crossings
Head of project: Don Cantor
Place: Boston University
Time: 1985

Cook/Contextual Performance Analysis
Title: *Contextual Analysis of Musical Performance*
Objective: to investigate performance nuance as a function of formal structure; Stage 1 restricted to rhythmic analysis; Stage 2 will be extended to intonation analysis
Investigator: Nicholas J. Cook
Place: Hong Kong
Computer: Hewlett Packard Integral PC
Other devices: custom built

Encoding: custom
Associated Literature: 'Structure and Performance Timing in Bach's C Major Prelude (WTC 1): An Empirical Study' (given at the 1986 Music Analysis Conference at Cambridge University; forthcoming in *Music Analysis*)

Crerar/Authorship Analysis (Valentini)
Title: "Elements of a Statistical Approach to the Question of Authorship," *Computers and the Humanities* **19** (1985), 175-182
Scope: reevaluates the statistical techniques advanced in W. J. Paisley's 1964 article on minor encoding habits [*Journal of Communcation* XIV/4, 219-37] with particular reference to a thematic index by the author of the music of Giuseppe Valentini (*c*.1680--after 1759) and its stylistic relationship to the music of Corelli and Vivaldi (105 incipits each)
Head of project: Alison Crerar
Place: Heriot-Watt University
Encoding: Plaine and Easie code
Associated Literature: "Giuseppe Valentini: A Computerized Instrumental Catalogue," M.Sc. dissertation (Computer Science), Heriot-Watt University (Edinburgh), 1983

Eastwood/French Baroque Air
Title: *The French Baroque Air in the Eighteenth Century*
Objective: to investigate the history of the style of all printed secular songs published in Paris, 1695-1740
Head of project: Anthony C. Eastwood
Associate: Christina A. Eastwood
Place: University of Western Australia
Time: 1984-90
Computer: Microbee
Encoding: Plaine and Easie code
Software: custom program (INFIND) for matching incipits
Associated Literature: "The French Air in the Eighteenth Century: A Neglected Area," *Studies in Music* **18** (1984), 84-98; "The Philosophical Implications of the Study of Numerically Large Repertories," *Studies in Music* **19** (1985)

Ebcioglu/Bach Chorale Harmonization
Title: "An Expert System for Schenkerian Synthesis of Chorales in the Style of J. S. Bach" in *Proceedings of the International Music Conference 1984*, 135-141
Aim: to define the Bach chorale style by testing 200 rules (in first-order predicate calculus) for harmonization, taking into account chordal skeletons, individual melodic lines, and hierarchical relationships
Head of project: Kemal Ebcioglu
Place: SUNY Buffalo
Time: 1984--
Software: BSL (Backtracking Specification Language) with 'C'

Ellis/Bach
Title: *Linear Aspects of the Fugues of J. S. Bach's Well-Tempered Clavier: A Quantitative Approach*
Scope: data entered in numerical code for counts of patterns, note recurrences, and pitch/interval or rhythmic groupings
Head of project: Mark Ellis
Place: University of Nottingham (Ph.D. thesis, 1980)
Hardware: ICL 2900 with Benson plotter
Software: FORTRAN
Associated Literature: "Are Traditional Statistical Methods Appropriate to Musical Analysis?" in *Proceedings of the Second International Symposium on Computers and Musicology, Orsay, 1981* (Paris, CNRS, 1983)

Gross/Harmonic Analysis
Title: "A Project in Computer-Assisted Harmonic Analysis" in *Computing in the Humanities* (Lexington, MA, 1981)
Head of project: Dorothy Gross
Place: University of Minnesota
Computer: CDC mainframes
Software: MUSTRAN with SNOBOL4
Associated Literature: "A Computer Project in Music Analysis," *Proceedings of the International Computer Music Conference*, ed. Hubert S. Howe (San Francisco, 1980)

Gross/Rhythmic Analysis
Title: *A Study of Rhythmic Complexity in Selected Twentieth- Century Works* in *Musical Grammars and Computer Analysis* (Florence, 1984), 337-344
Head of project: Dorothy Gross
Place: University of Minnesota
Computer: CDC mainframes
Software: MUSTRAN with SNOBOL4

Hofstetter/Nationalism
Title: "The Nationalistic Fingerprint in Nineteenth-Century Romantic Chamber Music," *Computers and the Humanities* 13 (1979), 105-119
Scope: differentiation of Czech, French, German, and Russian styles on the basis of melodic intervals in 130 melodies from 16 string quartets
Head of project: Fred T. Hofstetter
Place: Ohio State University

Houle/Articulation
Title: *Eighteenth-Century French Articulation as Described by Engramelle and Dom Bedos de Celles*
Scope: investigation of articulation as described in Engramelle's *La Tonotechnie* (1775)
Head of project: George Houle
Place: Stanford University
Computers: IBM PC and Macintosh
Software: custom ("Tonotechnie") by Roland Hutchinson

Jensen/Lute Ricercar
Title: *A Computerized Approach to the Early Italian Lute Ricercar*
Head of project: Richard Jensen
Place: UCLA
Time: 1985-87
Hardware: Macintosh; ImageWriter
Process: alphanumeric description of musical traits with associated iconographical files
Associated Literature: "A Computerized Approach to the Early Italian Lute Ricercar," *Journal of the Lute Society of America*, forthcoming

Kassler/Tonal Theory
Title: *Explications of the Theories of Tonality of A.F.C. Kollmann and Heinrich Schenker*
Purpose: exploration of rule systems by two highly original harmonic theorists [see Illustration #53]
Investigator: Michael Kassler
Computer(OS): Canon A-200 (MS-DOS)
Printing device: Canon LBP-8A2
Software: APL*Plus (music encoding and analysis)

Kimberlin/Ethiopian Church Music
Title: *Pattern Recognition in Ethiopian Church Music*
Purpose: to define qenet system, which forms the tonal basis of the music
Head of project: Cynthia Tse Kimberlin
Assistants: J. Kimberlin, Fu Su
Place: Hercules, CA
Computer: IBM PC compatible
Software: proprietary

Koozin/Takemitsu
Title: *Linearity and Pitch-Class Set Recurrence in Selected Works by Toru Takemitsu*
Scope: computation of normal order, integer equivalent, transposition type and prime form for any set of pitch-classes
Head of project: Timothy Koozin (Univ. of Cincinnati)

Associate: Mok Tokko
(Univ. of North Dakota)
Computer: IBM PC
Software: custom (MUSET), based on numeric input

Kwiatkowska/Graphic Dictionary
Title: *Graphic Music Dictionary*
Aim: to create simple graphic symbols for use in music analysis
Developer: Barbara Kwiatkowska
Place: Los Angeles
Time: 1985-86
Computer: Macintosh

Li/Bartok
Title: *A Study of Harmonic Organization in Bartok's String Quartets*
Scope: investigation of the harmonic features found in Bartok's string quartets with a view towards developing a system suitable for harmonic analysis of string and wind ensemble music
Investigator: Betty Li
Place: Hong Kong Baptist College
Time: 1987-88
Computer: VAX mini 11/750
Encoding: custom, alphanumeric
Software: custom, in SPITBOL

Ligabue & Giomi/Jazz
Title: *A software tool for generation and study of jazz*
Aim: definition of a system of rules capable of providing a model of jazz improvisation to facilitate automatic generation
Investigators: Marco Ligabue, Francesco Giomi
Place: Florence Conservatory
Time: 1985-87
Hardware: Gould 32/27, Yamaha CX-5
Software: TELETAU
Associated Literature: "Un sistema di regole per l'improvvisazzione jazzistica" in *Atti del VI colloquio di informatica musicale* ([Ligabue], Naples, 1986); "A System of Rules for Computer Improvisation," *ICMC Proceedings 1986*

Longyear/Macroanalysis
Aim: development of macroanalytical procedures for study of eighteenth and nineteenth century repertory
Head of project: Rey Longyear, with Kate Covington
Place: University of Kentucky

Moseley/Notre Dame notation
Title: *Source and Notation Studies, 1150-1200*
Aim: development of software for matching ligature patterns in Notre-Dame notation and other medieval polyphonic music
Head of project: Jane Moseley
Place: Nottingham University
Time: 1986-87
Computer: ICL 2984
Software: custom (DARMS-related)

Nettheim/Schubert
Title: *Analysis of the Works of Schubert*
Scope: oriented towards stylistic comparison with other ocmposers
Investigator: Nigel Nettheim
Place: Sydney Conservatorium
Hardware: IBM PC; Toshiba P1340
Software: custom

NewcombS/Sixteenth-Century Counterpoint
Title: "LASSO: An Intelligent Computer-Based Tutorial in Sixteenth-Century Counterpoint," *Computer Music Journal* 9/4 (1985), 49-61
Scope: describes an interactive learning environment for species counterpoint
Author: Steven Newcomb
Place: Florida State University

O'Maidin/Irish and Scottish Jigs
Title: "Computer Analysis of Irish and Scottish Jigs," *Musical Grammars and Computer Analysis* (Florence, 1984), 327-336
Scope: advances mathematical formulae for computation of the degree of relationship between tunes, taking into account measurements of intervallic distance and stress
Head of project: Donncha O'Maidin
Place: Waterford Regional Technical College (Eire)
Software: custom, with ALMA encoding

Pearce/Troubadours
Title: "Troubadours and Transposition: A Computer-Aided Study," *Computers and the Humanities* **16**/1 (1982)
Head of project: Alastair Pearce
Place: King's College, London
Software: custom

Pelinski/Eskimo Song
Title: "A Generative Grammar of Eskimo Songs" in *Musical Grammars and Computer Analysis* (Florence, 1984), 273-286
Scope: development of an algorithm that takes into account syntactic structures, structural elements, melodic modes, and rhythmic patterns and creates a melodic lexicon
Head of project: Ramón Pelinski
Place: University of Montréal

Plenkers/Cantigas
Title: *The Cantigas de Santa Maria*
Aim: pattern recognition
Head of project: Leo J. Plenkers
Place: University of Amsterdam
Time: 1984-88
Hardware: Data General / Eclipse
Software: custom
Associated Literature: "A Pattern Recognition System in the Study of the Cantigas de Santa Maria" in *Musical Grammars and Computer Analysis* (Florence, 1984), 59-70

Pont/Rhythm and Accent in Handel's Music
Title: *Rhythm and Accent in Handel's Music*
Aim: to analyze variations of rhythm, articulation, and ornamentation in the vocal and instrumental incipits of the arias from Handel's operas and oratorios, and to explore the encoded data systematically in order to gain a fuller understanding of Handel's style (genres, figures, rhetorical associations) and its relation to that of other composers (Rameau, Mozart)
Head of project: Graham Pont
Associates: Nigel Nettheim, Jennifer Nevile
Place: University of New South Wales
Time: 1983-88
Computers(OS): Osiris One (UNIX), Olivetti M24 (MS/DOS)
Software: Plaine and Easie code
Associated Literature: "A Revolution in the Science and Practice of Music," *Musicology* **V** (1979), 1-66; "Handel and Regularization: a Third Alternative," *Early Music* **XIII** (1985), 500-505

Rahn/Ars Antiqua Motets
Title: "Theories of Some Motets of the *Ars Antiqua*" in *Perspectives of New Music* (in English, forthcoming) and in *Musical Grammars and Computer Analysis* (Florence, 1984), 39-58 (in Italian)
Scope: applies twentieth-century analytical techniques to motets from the Montpellier Codex
Head of project: John Rahn
Place: University of Washington

Schaffrath/Folk Tune Analysis
Title: *Computer Assisted Analysis of Folk Tune Melodies*
Scope: input, storage, and analysis of folk tune melodies; studies of similarities and variants by means of a database system
Head of project: Helmut Schaffrath
Associate: Barbara Jesser
Place: Essen University

Computers: IBM mainframe; Olivetti PC M24
Encoding: ESAC (Essen Associative Code)
Associated Literature: ESAC manual [May 1987; available from author]

Schulenberg/C.P.E.Bach Variants
Title: *C.P.E. Bach: Critical Edition*
Scope: collation of variants in sources of keyboard concertos
Head of project: David Schulenberg
Computer: Kaypro 4
Software: Perfect Filer with letter code [available from author]

ShapiroA/Tune Families
Title: *Handbook of British-American Tune Families*
Scope: 3,000 tunes from the most frequently used collections of British-American folksong, with data about stressed tones, cadence tones, etc.
Head of project: Ann Dhu Shapiro
Place: Harvard University
Time: 1983-7
Hardware: DEC VAX (text); Macintosh with Yamaha DX-7 (music)
Software: custom designed (by David Epstein and Kate Fissell) in 'C'

Silbiger/Modality - Tonality
Title: *The Emergence of the Major-Minor Key System in Seventeenth-Century German Keyboard Music*
Scope: an application and extension of statistical techniques applied previously to Italian repertories (Gabrieli, Monteverdi, Frescobaldi, Corelli)
Head of project: Alexander Silbiger
Associate: J. Michael Allsen
Place: University of Wisconsin; Duke University
Time: 1983-7
Computer: Apple // and //e
Software: numerical representation in BASIC
Associated Literature: report of the conference "From Scheidt to Buxtehude" (Wellesley College, June 1987)

Silbiger/Tonal Types
Title: *Tonal Types in the Keyboard Music of Frescobaldi* in the *Proceedings of the Ferrara Frescobaldi Conference*, 1983)
Reseacher: Alexander Silbiger
Place: University of Wisconsin
Time: 1982-3
Computer: Apple // and //e
Software: numerical representation in BASIC
Associated Literature: "Tipi tonali nella musica di Frescobaldi," *Gerolamo Frescobaldi nel IV Centenario della nascita* (Florence, 1986), 301-14

Simonson/West African Music
Title: *A Tool for User-Defined Notation and Analysis of West African* Jaliva
Purpose: to develop a software tool for musical and textual display and analysis of Jaliva, especially of Mandinka *kora* music (a heptatonic tonal multi-modal West African art music)
Investigator: Linda Simonson
Associate: William LeJeune Brown
Place: Laurel, MD
Time: 1987-9
Computer: Amiga

Stech/Microanalysis
Title: "A Computer-Assisted Approach to Micro-Analysis of Melodic Lines" in *CHum* XV/4 (1981)
Scope: 3000 records
Head of project: David Stech
Place: University of Alaska (Ph.D. thesis, U. of Michigan, 1976)
Computer: IBM mainframe

Steel/Troubadours
Tite: *Evolution of a Musical Style: Early, Middle, and Late Troubadours*
Scope: compares repertory of twelfth and thirteenth-century Provencal troubadours in diverse neumatic notations with selected chant and other monophonic secular repertories
Head of project: Matthew Steel
Place: University of Michigan
Time: in progress
Computers: Amdahl mainframe; IBM PC XT
Encoding: custom
Database software: MTS, SPIRES

Suchoff/Bartók
Title: *A Bartók Source Database*
Head of project: Benjamin Suchoff
Associate: Elliott Antokoletz
Time: 1985-86
Hardware: Macintosh, Imagewriter
Software: abbreviated DARMS

Sward/Babbitt and Xenakis
Title: *An Examination of the Mathematical Systems Used in Selected Compositions of Milton Babbitt and Iannis Xenakis*
Head of project: Rosalie Sward
Place: Northwestern University (Ph.D., 1981)

Terricciano/Jazz
Title: *Contour Analysis in Monophonic Jazz Solos*
Purpose: to test a method of analyzing melodic structure of jazz solos on three levels -- the phrase, the chorus, and the solo as a whole
Investigator: Alan Terricciano
Place: Eastman School of Music
Time: 1986
Computer(OS): Digital Professional 350 (VENIX)
Encoding: integer representation of pitch

Trowbridge/Chanson
Title: "Style Change in the Fifteenth-Century Chanson," *Journal of Musicology* **IV**/2 (1985-6), 146-170
Scope: attempts to provide attributions for *c*.90 anonymous works associated variously with Binchois, Dufay, Ockeghem, and Busnois, whose individual traits are closely examined
Head of project: Lynn M. Trowbridge
Place: University of Illinois (Ph.D. thesis, 1982)
Software: LMIL with COBOL

Wenk/Debussy Harmony
Title: *A Grammar of Debussy's Harmonic Practice*
Aims: to write a formal grammar, based on the Baroni/Jacoboni model, to describe the harmonic content of a corpus of 92 initial phrases of instrumental works and to test this grammar by means of computer simulations
Head of project: Arthur Wenk
Place: Québec
Time: 1987-88
Computer: Texas Instruments Professional
Encoding: custom
Software: Music Processor (in 'C')

Wenk/Debussy Melody
Title: *A Grammar of Debussy's Melodic Practice*
Aims: to write a formal grammar, based on the Baroni/Jacoboni model, for a corpus of 92 initial phrases of instrumental works and to test this grammar by means of computer simulations
Head of project: Arthur Wenk
Place: Québec
Time: 1980-87
Computer: Texas Instruments Professional
Encoding: custom
Associated Literature: "Parsing Debussy: Proposal for a Grammar of His Melodic Practice" (forthcoming)
Associated Literature: "Varieties of Musical Analysis: Through the Analytical Sieve and Beyond," *Proceedings of the Conference on Music Bibliography, Northwestern University, 1986;* "Parsing Debussy: Proposal for a Grammar of His Melodic Practice," *In Theory Only* **9**/8 (1987) and *Musikometrika* **1** (1987); "Debussy's 'Little Chemistry': Melody at the Molecular Level" [forthcoming]

III. General Applications in Musical Analysis and Musical Information Processing

A. Data Structures, Representation Systems, and Computer Procedures for Musical Analysis

Balaban/Tonal Theory
Title: *A Computer Basis for Research on Western Tonal Music Theories*
Purpose: to develop a formal basis for the study of music
Head of project: Mira Balaban
Place: SUNY Albany
Computer(OS): VAX 750 (UNIX)
Software: C-Prolog
Associated Literature: "Foundations for AI Research of Western Tonal Music," *Proceedings of the International Computer Music Conference 1985*, p. 375; "CSM--A Formal Basis for Research in Theories of Western Tonal Music - an AI Approach," [*Computer Music Journal*, forthcoming]

Berardinis/Structural Analysis of Atonal Music
Title: "The Microcomputer in the Structural Analysis of Atonal Music" [in Italian] in the *Quaderno informatica musicale* (1984)
Scope: provides sample programs to generate tables of "normal order" and "prime forms"
Investigator: Piero de Berardinis
Place: Studio di Sonologia Computazionale, Pescara
Computer: Apple //
Encoding: numerical (programs in BASIC)

Bevil/Folktune Analysis
Title: *Textfile Functions and Array Manipulation in the Application of the Microcomputer to Folktune Analysis and Comparison*
Aim: determination of tune kinships based on concordances of pitch, duration, and stress
Head of project: J. Marshall Bevil
Place: Houston
Computer: Apple //+
Software: custom designed (in BASIC)
Associated Literature: "Centonization and Concordance in the American Southern Uplands Folksong Melody" (Ph.D. thesis, North Texas State University, 1984)

Boroda/Elementary Metrorhythmical Units
Title: "On the Concept of the Elementary Metrorhythmical Unit in Music" [in Russian], *Bulletin of the Academy of Sciences of the Georgian SSR* **71/3** (1973)
Investigator: Moisei Boroda
Place: Tbilisi Conservatory

Boroda/Informational Melodic Units
Title: "On the Definition of a Phrase-Type Informational Melodic Unit" [in Russian], *Bulletin of the Academy of Sciences of the Georgian SSR* **89/1** (1978)
Purpose: to formulate general principles of melody segmentation and to isolate, on their basis, a hierarchical system of unambiguously defined melodic units giving natural segmentation within the broad group of musical styles
Investigator: Moisei Boroda
Place: Tbilisi Conservatory
Associated Literature: German translation in *Sprache, Text, Kunst: Quantitative Analysen* (*Quantitative Linguistics* **15**, Bochum, 1982)

Boroda/Structural Units
Title: *The Segmentation Problem in Music: Structural Units of Musical Language* [in Russian], monograph No. 1203 of the Lenin Library, Moscow, 1986
Purposes: to isolate strongly determined basic units of musical language; general quantitative principles and regularities of the organization of the musical composition; and interrelationships between music and natural language
Investigator: Moisei Boroda
Place: Tbilisi Conservatory

Brinkman/Score Analysis
Title: "A Data Structure for Computer Analysis of Musical Scores" in the *Proceedings of the International Computer Music Conference 1984*, 233-242
Scope: describes a doubly-linked ring structure to facilitate rapid access to specific points in a score, specifically in variable textures; Bartók's Fourth String Quartet is used as an example
Head of project: Alexander Brinkman
Place: Eastman School of Music
Software: DARMS encoding
Associated Literature: "Representing Musical Scores for Computer Analysis," *Journal of Music Theory* 30/2 (1986), 225-75

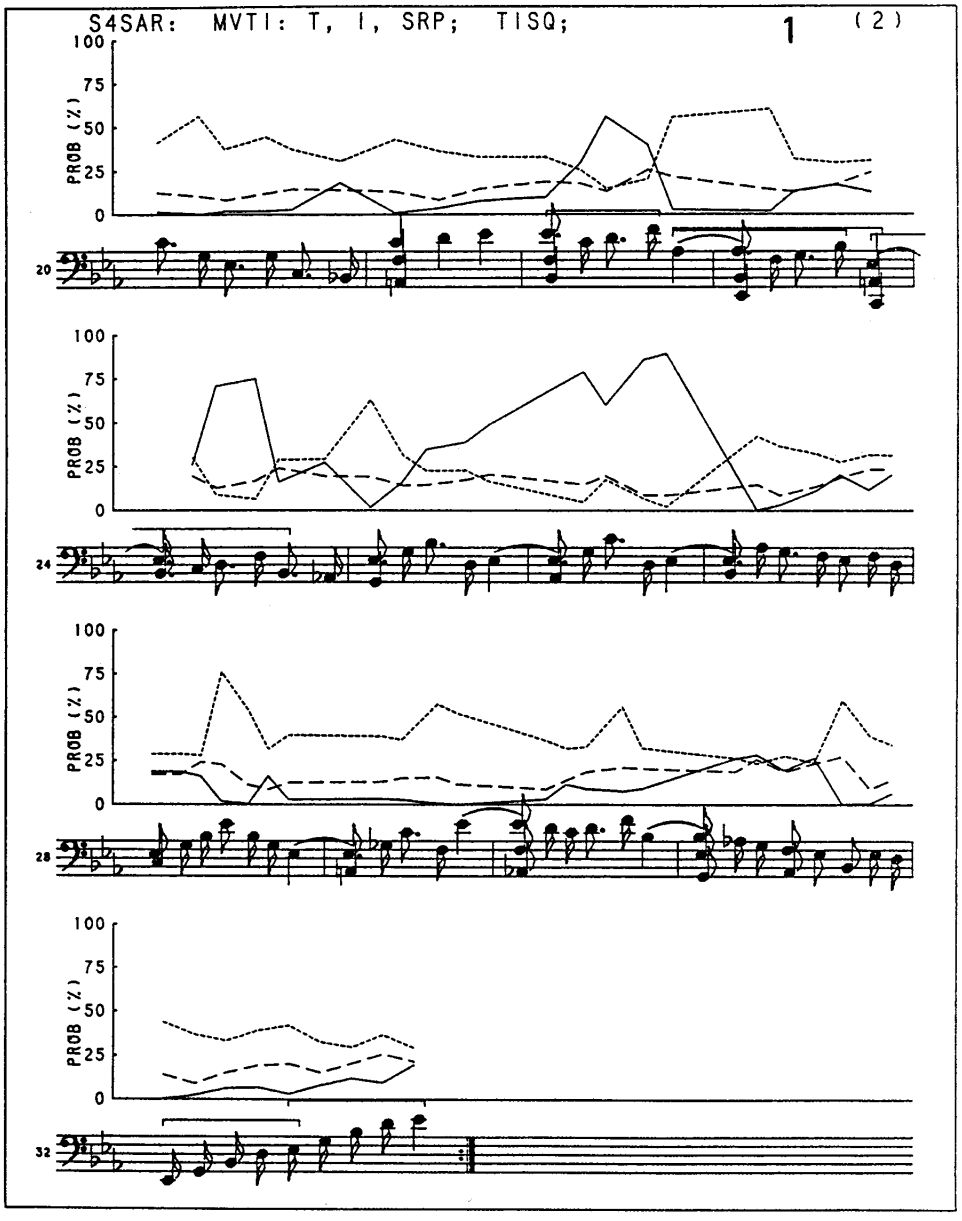
Brinkman & Harris/Contemporary Music Analysis Package (CMAP)
Title: *Contemporary Music Analaysis Package*
Scope: a set of 20 programs for analysis, modelling, and composition of atonal and serial music; includes a compiled database of pitch-class set information and a library of subroutines for bitwise manipulation of pitch-class sets
Developers: Alexander Brinkman and Craig Harris
Places: Rochester, NY and Ann Arbor, MI
Time: 1986--
Computer: IBM PC initially; Macintosh version under development
Operating system: UNIX family initially; MS/DOS version under development
Software: in 'C'
Encoding: hexadecimal notation (0..b) or set names
Associated Literature: "A Unified Set of Software Tools for Computer-Assisted Set-Theoretic and Serial Analysis of Contemporary Music," *Proceedings of the 1986 International Computer Music Conference* [Harris and Brinkman]; "Computer Programs for Set-Theoretic and Serial Analysis of Contemporary Music" (Ph.D. dissertation by Harris, Eastman School of Music, 1986)

Broadbent/Thematic Analysis
Title: *Computer Assisted Thematic Analysis*
Purpose: to develop a self-contained computer system to analyze the construction of compositions
Investigator: Clive Broadbent
Place: University of Durham (UK)
Time: 1986-88
Computer(OS): Amdahl (MTS)
Encoding: custom
Printing devices: QMS 1200 laser printer; unspecified plotter
Papers in progress: "Toward a Programming Language for Musical Analysis," "A Non-intelligent Music Typesetter," "The Computer Implementation of Analytical Method," "Toward a Processable Representation of Analytical Intuition"

Illustration 54

Musical Analysis -- 2

David Coombs: Probability theory applied to Bach cello suites.



Camilleri/Grouping and Harmonic Segmentation
Title: *Grouping and Harmonic Segmentation*
Purpose: to develop software for grouping and harmonic segmentation based on Lerdahl and Jackendoff's theory and other rule systems
Investigator: Lelio Camilleri
Places: Pisa (CNUCE) and Florence (Conservatory)
Time: 1987--
Computer: IBM 3081
Software and encoding: TELETAU
Associated Literature: "A Computational Theory of Music: Five Definitions" [paper presented at the International Colloquium on *Basic Concepts in Studies of Musical Signification*, July 21-3, Imatra, Finland [forthcoming in *Semiotic Webb*; Indiana University Press]

Camilleri/Music Analysis
Title: "A Software Tool for Music Analysis," *Interface* **XVII**/1-2 (1987)
Scope: creation of an analytical environment comprising programs using statistical and quantitative techniques and analytical strategies derived from diverse musical theories
Head of project: Lelio Camilleri
Place: CNUCE (Florence), Musicology Division
Time: 1983-7
Hardware: IBM 3081, Gould 32/27
Software: TELETAU

Camilleri/Tonal Harmonic Analysis
Title: *An Expert System for Tonal Harmonic Analysis*
Scope: establishment of an expert system based mainly on the hierarchical approach to harmonic structure of Lerdahl and Jackendoff
Head of project: Lelio Camilleri
Associate: Francesco Carreras
Place: CNUCE (Florence), Musicology Division
Time: 1985-8
Computers: IBM 3081, IBM PC
Software: TELETAU

Carr & Porter/Perle's Tonality
Title: *ttt: An Aid for Composers and Theorists using George Perle's Twelve-Tone Tonality System*
Purpose: to create a software aid that replaces manual methods for use of Perle's system
Investigators: James Carr and Charles Porter
Place: New York
Time: 1987
Computer: Macintosh
Software: in 'C'
Printing devices: Apple ImageWriter and LaserWriter

Carter/Lute Tablature
Title: *Lute Tablature Transcription*
Purpose: to translate French and Italian lute tablature into conventional notation
Investigator: Marie Carter
Place: Eastman School of Music
Time: 1986
Computer(OS): DEC Professional 350

Colombo/Harmonic Regularity
Title: *Mathematical Models for Harmonic and Regularity Analysis of Musical Texts*
Aim: development of a series of programs for tonal harmonic analysis based on Schoenberg's theory of regions
Head of project: Walter Colombo
Supervisor: Goffredo Haus
Place: University of Milan
Computer: Sinclair QL

Coombs/Information Theory
Title: *Information Theory Applied to J. S. Bach's unaccompanied cello suites*
Purpose: to apply information theory to a specific repertory; the program pro-

duces graphs showing the probability of various parameters [see Illustration #54]
Investigator: David Coombs
Place: Eastman School of Music
Time: 1984
Hardware: Calcomp plotter
Associated Literature: "An Analysis of Expectation in Music: A Computer-Aided Study" (M.A. thesis, 1984)

DallaLibera/Retrieval Techniques
Title: *Music Retrieval by Incipit Information*
Purpose: to experiment with text processing techniques in music processing
Head of Project: Francesco DallaLibera
Associates: Susi Dulli, Franco Crivellari
Place: Statistics Faculty, University of Padua
Time: 1987-9
Computer: IBM PC compatible

Fink/Data Indexing
Title: *DataMuse*
Purpose: to develop a musical database program with the capacity to index and search musical scores; permits user specification of field names and structure; music stored in linked list representation of scores [see Brinkman: Score Analysis]
Investigator: Robert Fink
Place: Eastman School of Music
Time: 1986
Computer(OS): DEC Professional 350 (VENIX)
Encoding: DARMS

Forte/Pitch-Class Sets
Title: *Pitch-Class Sets and Relations*
Head of project: Allen Forte
Place: Yale University
Computer: IBM PC AT
Software: custom (SNOBOL4+)

Gibson/Pitch-Class Set Identity
Toward an Understanding of Pitch-Class Set Identity as a Measure of Aural Similarity in Nontraditional Chords
Purpose: to determine the significance of octave equivalence as a measure of aural similarity
Investigator: Don Gibson
Place: Baylor University
Time: 1986
Computer: Apple //e

Hewlett/Pitch Representation
Title: "A System for Numeric Representation of Musical Pitch Notation" [forthcoming]
Scope: proposes a base-40 system for discrete description of musical pitches, recognizing absolute pitch, letter (and octave) name, and written accidentals; discusses this system in the context of other number line representation systems and offers a general theory of interval invariant representations of pitch
Head of project: Walter Hewlett
Place: Menlo Park, CA
Time: 1984-7
Hardware/Software: Device independent

Jackson/Horizontal and Vertical Analysis
Title: *Horizontal and Vertical Analysis Data Extraction Using a Computer Program*
Aim: retrieval of selected musical data (roots, pitch classes, intervallic relationships) from twentieth-century repertory
Head of project: David L. Jackson
Place: University of Cincinnati (Ph.D. thesis, 1981)
Computer: Amdahl 4700
Software: custom designed encoding system with FORTRAN

Kolosick/Pitch Relationships
Title: "A Computer Representation of Pitch Relationships: Toward a Music Expert System," paper given at the annual meeting of the Society for Music Theory, Vancouver, November 1985
Scope: numeric representation of intervals derived from the Circle of Fifths
Head of project: Timothy Kolosick
Place: University of Arizona

Laprade/Contour-Class
Title: *A Program for the Calculation of Similarity Measurements for Contour and Pitch-Class Sets*
Purpose: to establish a means for the expeditious processing of pitch-class and contour-class sets through a series of similarity measures
Investigator: Paul Laprade
Place: Eastman School of Music
Time: 1987
Computer(OS): Digital Professional 350 (VENIX)

McVity/Algorithmic Composition
Title: *A History of Algorithm Composition*
Purpose: to unify expert systems for generating tonal music
Investigator: Jonathan McVity
Place: Arlington, VA
Hardware: Macintosh, MIDI instruments
Encoding: 32-bit representation

Morehen/Validity
Title: "Computer-Assisted Musical Analysis: a Question of Validity," *ICMC Proceedings 1986*
Aim: to examine the extent to which computer-assisted stylistic analysis is a valid exercise, especially in relation to polyphonic music before 1600; raises questions about defining phrase length, accounting for the direction of melodic intervals, ignoring the distinction between duple- and triple-meter contexts in analyzing durations, and so forth
Investigator: John Morehen
Place: Nottingham University

Morse/Graphic Analysis
Title: *Use of Microcomputer Graphics to Aid in the Analysis of Music*
Scope: developing of a music encoding language and software for tabulation, time-domain graphic presentation, and performance of standard notation
Head of project; Raymond Morse
Associate: Lauren Dunn (encoding system)
Place: University of Oregon (D.M.A., 1985)
Hardware: Apple //, Epson MX-80

Roeder/Declarative Analysis
Title: *Declarative Analysis of Atonal Music*
Purpose: to develop predicate-calculus expression of analytical understanding of atonal works by Schönberg, Berg, and others
Investigator: John Roeder
Place: University of British Columbia
Time: 1988--
Computer(OS): VAX (UNIX)
Software: custom, in CProlog

Russell/Pitch-Class Sets
Title: *A Set of Microcomputer Programs to Aid in the Analysis of Atonal Music* [paper given in the ICCH meeting in Provo, Utah, June 1985]
Scope: a series of programs to explore pitch-class sets, following the theoretical concepts advanced by Forte (1973), Rahn (1980) and Wittlich (1975)
Head of project: Roberta Russell
Place: University of Oregon (D.M.A. thesis, 1983)
Computer: Apple //

Solomon/Pitch-Class Sets
Title: *Music Set Analysis* (software)
Developer: Larry Solomon
Place: University of Arizona
Computer: Apple //

Spiegel/Modality - Tonality
Title: *Generative Algorithms for Tonal and Modal Music*
Head of Project: Laurie Spiegel
Place: New York City
Software: custom

Stépien/Melodic Fragment Classification
Title: Classification of Variable Length Melodic Fragments
Scope: designed for applications in ethnomusicology
Head of project: Bernard Stépien
Associate: Luigi Logrippo
Computers: Amdahl / IBM PC
Analysis software: MUSICANA (custom)
Encoding: alphanumeric

Stépien and Logrippo/Cluster Analysis
Title: "Cluster Analysis for the Computer-Assisted Statistical Analysis of Melodies," *Computers and the Humanities* **20** (1986)
Aims: to compare several kinds of analysis packages in the study of a database of monophonic songs and to explore the uses of cluster analysis in the classification of melodies by pattern types [cluster analysis is a method of classifying a set of entities (melodies, in this case) according to a predefined set of indicators (here notes)]
Place: University of Ottawa (Dept. of Computer Science)
Time: 1980-86

B. Computational Music Theory

Alegant/Even-Partition Mozaics
Title: *Even-Partition Mozaics*
Purpose: to generate all equal partitions of the aggregate (dyads, trichords, tetrachords, hexachords) and to tabulate the possible set-class combinations
Head of project: Brian Alegant
Place: Eastman School of Music
Date of completion: February 1987
Computer: DEC 350 (VENIX)
Software: custom in 'C'

Jungleib/Modes
Title: *Music Possible* (Los Altos, CA., 1985)
Scope: a digital analysis of tonality listing all conceivable 2-, 3-, and 4-note modes together with 266 of the 462 possible 7-note modes and a representative sample of modes based on other numbers of notes
Head of project: Stanley Jungleib
Place: Los Altos, CA
Time: 1983-85
Hardware: Xerox 860, Commodore-64 with MIDI interface

Schottstaedt/Species Counterpoint
Title: *Automatic Species Counterpoint*
Purpose: to generate second-species counterpoints to a given cantus firmus following Fux's rules
Investigator: Bill Schottstaedt
Place: Stanford University
Time: 1984

Wright/Species Counterpoint
Title: *Species Counterpoint*
Purpose: to develop a recursive algorithm that generates all "correct" counterpoints in first and second species to a given cantus firmus in the major mode, according to a given set of principles
Investigator: Rhonda Wright
Place: Eastman School of Music
Time: 1987
Computer: IBM PC
Software: custom, in "C"
Associated Literature: David Lewin, "An Interesting Global Rule for Species Counterpoint," *In Theory Only* 6/8, 19-44

IV. Musical Information Processing

Facilities and Integrated Systems

ALBANY

Mira Balaban and others at the State University of New York at Albany are developing a "hierarchy-based music workstation" to provide a uniform basis for analysis, instruction, composition, and typesetting of music. The system is UNIX-based and involves an Imagen laser printer.

DELAWARE

Fred Hofstetter and Michael Arenson head the GUIDO music learning system at the University of Delaware. The system, which utilizes Macintosh and IBM micro-computers as well as PLATO terminals, has recently come to include video discs. Literature on the system includes "Computer-Based Aural Training: the GUIDO System," *Journal of Computer-Based Instruction* 7 (1981), 84-92 [Hofstetter] and "Computer-Based Instruction in Musicianship Training: Some Issues and Answers," *Computers and the Humanities* 18/3 (1984), 157-164 [Arenson].

The Videodisc Music Series initiated in 1981 has recently been released. Designed for teaching, the four discs provide simultanenous sound and graphics. Fourteen institutions collaborated on the project, which was supported by the National Endowment for the Humanities. Hofstetter was the principal investigator.

HAIFA

MUSICIAN is the name of a system for music processing and synthesis under development at the Laboratory for Computer Music Engineering at the Technion-Israel Institute of Technology in Haifa, Israel. The system is based on mainframe computers (PDP11 and VAX11) running programs in FORTRAN77 and uses both digital and analog synthesizers. Currently oriented toward synthesis and acoustical applications, MUSICIAN's designers are also interested in questions of music representation and in devising a notational system for electroacoustic music.

LOS ANGELES: UCLA

Roger Kendall and Irene Levenson continue to develop a system at UCLA for teaching harmony and other aspects of music theory. In its current phase their work uses an IBM PC with a mouse. Personal Composer is used with an Apple LaserWriter for music printing. Custom software for analysis is used.

MILAN

At the Laboratorio di Informatica Musicale in Milan, a personal music workstation is under development by Goffredo Haus and his colleagues. It is oriented largely toward acoustical manipulation (analysis, transformation, synthesis) and music printing. It uses both Apple Macintosh and IBM computers and printers and accommodates both MIDI keyboards and a DARMS-like code.

The LIM system can generate a number of musical ornaments of the seventeenth and eighteenth centuries (trill, mordent, appoggiatura, etc.) in numerous permutations. Capabilities for automatic transcription of taped electronic music and for score analysis following the Lerdahl/Jackendoff and Bertoni/Haus/Mauri/Torelli models also exist. Score printing is supported; following the establishment of a minimum set of musical symbols, a digital music font has been implemented with METAFONT.

MOSCOW

Within the Department of Pattern Recognition of the Computer Centre of the USSR Academy of Science in Moscow, an active research program is currently being developed under the auspices of the Composer's Union Commission on Popular Creativity. Particular areas of interest are automatic transcription of performance, synthesis of "human-like" performance, analysis of folk music, description of performance rules, semantics of performance, and simulation of performance expression and improvisation. The hardware is primarily of Soviet manufacture. Andranick Tanguiane is one of three co-chairs of a working group on "Mathematical Methods in Musicology." His coworkers include Victor Kalyan and Natalia Michailova.

OSLO

The MUSIKUS project at Oslo University is aimed at musical analysis and the development of a graphical representation of musical scores. It involves VAX and micro-VAX hardware and uses its own encoding system, MUSIKODE.

PARIS

A Système d'Informatique Musicale at the Université de Paris--VIII is being developed with MIDI input and a series of IBM computers, both mainframe and personal, to support composition, transcription, analysis, and printing. Horacio Vaggione is the project leader.

SARDINIA

A composer workstation is under development at the Centro Informatica Musicale in Caguari, Sardinia. Nicola Bernardini (Rome) and others are working on this IBM PC compatible system. The project is reported in the *ICMI 1986 Proceedings*.

TOKYO

Professor Samadu Ohteru heads a collaboration of approximately 50 people involved in a multifaceted program in musical robotics. His group, under the wing of the Applied Physics Department of Waseda University, includes engineers, computer scientists, musicologists, and performers. The overall purpose of the group's work is to develop an integrated musical informaton system. Recent work has focused on automatic recognition of printed music and bilateral translation between a printed score and Braille notation. Separate encoding systems are used for these activities, but there is some interest in devising a unified code. Recreation of printed music from an automatically recognized score follows extensive work directed towards performance from an automatically recognized score. The robot WABOT-2 can be seen in a videotape made at the University using all ten "fingers" and both "feet" in performances of the repertory that his "brain" can scan. WABOT-2 also provides automatic accompaniments for singers and is equipped to comment on elements of human performance that deviate from its expectations.

The research program is carried out in a UNIX environment using 'C'. Some of the main hardware components of the system are a NEC PC-9801 with a music generator board and a high resolution CCD camera, PIC-2300. The WABOT vision system is described in the *Proceedings of the International Conference on Advanced Robotics, September 1985*, pp. 477-482, and in Bulletin No. 112 of the Science and Engineering Research Laboratory of the University (1985), pp. 25-52.

WATERFORD

Donncha Sean O'Maidin's system, under development at the Waterford Regional Technical College (Eire), is based on a VAX-11/780 linked to a MIDI keyboard, and various printers and sound output devices. Musical data is scored in a customized version of ALMA and printed using SMUT.

Programs of Study

FLORENCE

A course in computer music at the Florence Conservatory extends to the study of computer applications in musicology. The course utilizes TELETAU resources (including data and software) developed by the Musicological Department of CNUCE [the Institute of the National Research Council] in Pisa. Lelio Camilleri implements the course. Pietro Grossi chairs the CNUCE musicology department.

NOTTINGHAM

The University of Nottingham (UK) offers an M.A. degree in Computer Studies in Musicology. The curriculum includes courses in applied programming, analytical methods, use of databases, and the history of applications in music. Ian Bent and John Morehen have developed the program over several years.

ROCHESTER

Alexander Brinkman offers a two-semester graduate course in Computer Applications in Music Research at the Eastman School of Music in Rochester, NY. The course combines instruction in Pascal and data structures with techniques for music encoding and processing. Computer applications may also be selected as a secondary field of emphasis in the Ph.D. program in Music Theory.

STANFORD

John Chowning and others at the Center for Research on Music and Acoustics at Stanford University offer an M.A. program in "Computational Musicology"; the focus is primarily on matters related to acoustics and sound synthesis.

TALLAHASSEE

The Center for Music Research at Florida State University offers a certificate program in Computers in Music that provides instruction in computer graphics programming, design in instructional materials, and statistical analysis methods. The program is available to both undergraduate and graduate students.

Short Courses

Gary Wittlich regularly teaches courses at Indiana University that involve computer-assisted analysis. David Crawford offers an introduction of computer-assisted music research annually. Allen Forte offers a graduate course at Yale University on "The Use of the Microcomputer for Music Research." An undergraduate course in musical stylometrics is under development at the University of Ulster.

Jon Appleton of Dartmouth College will again offer a summer seminar for musicologists, theorists, and composers on "Music and Technology". The seminar will consider the ways in which composers, performers, and listeners interact with technology and will assess the impact of electronics on the role of music in culture and on concepts of style in Western art music. The dates for this course, which was also given in 1980 and 1984 and is funded in part by the National Endowment for the Humanities, are June 22 to August 14.