

Search

FEATURE

Music to Soothe the Savage Searcher

Classical Music Databases and Web Resources

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The year 2006 marks the 250th birthday of Austrian musician and composer, Wolfgang Amadeus Mozart. I thought the occasion might warrant a review of Web databases and related online resources covering the European classical musical traditions from Mozart's musical antecedents up to contemporary composers. Despite many dire predictions of its demise, performances and recordings of European classical music, which I root in the works of the greatest triumvirate of composers from the 18th and 19th centuries — Johann Sebastian Bach, Wolfgang Amadeus Mozart, and Ludwig von Beethoven — continue to adapt and thrive in our postmodernist, digital world. As New York Philharmonic violinist Fiona Simon said in a *New York Times* article about Internet distribution of classical music concert and studio recordings, "Downloading is probably the way that classical music is going to be distributed in the future. The CD isn't dead yet, but it's fading" (Barbara Jepson, "Classical, Now Without the 300-Year Delay," *The New York Times*, March 26, 2006).

The Web offers a wide variety of classical music resources, from audio files to downloadable music to encyclopedic Web sites, devoted to the European musical canon and its enduring influence, especially in North America. In selecting many of the sites, I focused more on composer rather than performer data. Because the sources are readily available through academic music libraries, I paid less attention to free and subscription-based bibliographic databases and print reference sources such as *The Music Index: A Subject-Author Guide to Music Periodical Literature* (Harmonie Park Press; <http://www.harmonieparkpress.com/MusicIndex.asp>), *RILM Abstracts of Music Literature* (<http://www.rilm.org>), *RIPM: Retrospective Index to Music Periodicals* (<http://www.ripm.org>), *Doctoral Dissertations in Musicology-Online* (DDM-Online; <http://www.music.indiana.edu/ddm/>), or the Library and Archives Canada's Canadian Music Periodical Index (<http://www.collectionscanada.ca/4/16/index-e.html>). I conducted my Web review during February and March 2006.

Improvisation: Searching for That Classical Beat

The venerable Yahoo! targets music lovers with its Yahoo! Audio search (<http://search.yahoo.com/audio> or <http://audio.search.yahoo.com>) and Yahoo! Music portal (<http://music.yahoo.com>). Unique among the audio search engines I tried, Yahoo! Audio lets users refine search results and narrow results by, for example, file format and duration. Yahoo! Music also offers a subscription-based option called Yahoo! Music Unlimited. This service provides downloadable files in MP3 or Windows Media Player formats. If you own an Apple iPod, take a look at the online help for Yahoo! Music and Yahoo! Music Unlimited for some useful compatibility tips. Like Apple's iTunes software, Yahoo! makes its Yahoo! Music Engine freely available, no doubt with the hope that visitors will turn into paying customers. Other than information from the music industry, the only other freebie at Yahoo! Music is its LAUNCHCast radio service, which also comes in a subscription service.

Microsoft MSN Entertainment (<http://entertainment.msn.com>) comprises two musical components, **MSN Music** (<http://music.msn.com>), which hopes to capture some of Apple's successful iTunes digital music store magic (<http://www.apple.com/itunes/>), and **MSN Radio** (<http://radio.msn.com>). Some MSN services require registration for the free MSN account. According to *The New York Times*, MTV Networks, with a little help from Microsoft in terms of service integration with Windows Media Player 11, will inaugurate a new digital music service called **Urge** (<http://www.urge.com> and <http://www.microsoft.com/windowsvista/experiences/music.msp>) in 2006. MTV Networks' Michael Bloom quipped, "We're going to give classical as much love as we give hip-hop or pop" (Jepson, *The New York Times*).

Singingfish (<http://www.singingfish.com>) specifically targets audio and video files on the Web. Based on a 2004 user survey, Singingfish reported that 61 percent of visitors came there to search for audio files (<http://search.singingfish.com/sfw/websolutions.html>, viewed Feb. 26, 2006). I ran a typical search for audio-only MP3 files in the music and radio category with the keyword **classical** and came up with about 9,000 fewer hits than Alta Vista's audio search. The Singingfish metadata, compared to Alta Vista's, is rather limited and inconsistent, often with no artist or performer information. At a minimum, Singingfish only provides a hyperlinked title, duration, source URL, and file type and size.

Like Microsoft, Google isn't perfect. Sometimes I scratch my head and wonder why. Anyone who knows Google's spectrum of search tools must wonder why, since Google lets us search for images and video, it hasn't yet singled out

audio files for special treatment. As of May 1, 2006, Google did not support searching for specific audio file formats, even through its advanced search interface. A workaround, however, exists through a Google music search feature introduced late in 2005. To use the Google music search, simply preface your keywords with **music:**. (For more information on how Google assists searchers looking for information on music and musicians, see "Google Adds Music Search Feature" by Chris Sherman and Gary Price, Search Engine Watch, Dec. 15, 2005, <http://searchenginewatch.com/searchday/article.php/3571066>.) According to the Google Help Center, "If you enter the name of an artist popular in the U.S. into the search box, we will display user reviews, song titles, stores to purchase the music [e.g., online download retail and streaming audio services such as Amazon, AOL Music Now, eMusic, iTunes, MSN Music, Napster, Wal-Mart, etc.] and other useful information related to that artist at the top of your search results."

Compare the Singingfish return to the staggering 30 million-plus matches from a Google Search of **mp3 classical**. Since Google does not provide any meaningful data clustering or sorting, I had to add further search terms, such as the title of a composition or a composer or performer's name, to produce relevant results. You can try filtering your results through the Usage Rights choices on the advanced search page. When I ran the **mp3 classical** search against the "Search only pages that are free to use or share," my results dropped down to a mere 452,000. By comparison, my finely tuned query of **allintext: mp3 mozart symphony no 40** limited to English-language pages and filtered for free to use or share content landed me 85 hits. Removing **allintext:** bumped up the hits to 108. According to the Google Web APIs Reference page [<http://www.google.com/apis/reference.html>], "Starting a query with the term 'allintext:' restricts the results to those with all of the query words in only the body text, ignoring link, URL, and title matches." Although I don't generally use **Google Groups** [<http://groups.google.com>], it can provide a way to search for classical music information in newsgroups such as rec.music.classical, rec.music.classical.contemporary, rec.music.classical.recordings, and rec.music.opera.

Besides Yahoo! Audio, other Web search engines with an audio file search facility include the venerable **Alta Vista Audio Search** [<http://www.altavista.com/audio/>]; **AlltheWeb.com** [<http://www.alltheweb.com>]; the **Music Robot** [<http://www.musicrobot.com>], also known as the MIDI Explorer and searching only for MIDI files; and the **Lyrics Robot** [<http://www.lyricsrobot.com>], part of the same site and where I retrieved over 200 entries for Mozart. Be aware that due to search engine company consolidations, some of these search engines are drawing from the same database, only the interface brand and, sometimes, the search options differ. Depending on who supplies the information, Alta Vista can supply detailed metadata for some MP3 files. **AudioFind** [<http://audiofind.com>] indexes Usenet newsgroups such as alt.bina.ries.sounds.mp3.classical, but I needed to use a newsgroup reader capable of accessing the audio content, much of it posted illegally.

ez2find [http://ez2find.com/channel/advanced_search.php?meta=Music] is one example of a metasearch site for audio (MP3 and MIDI) files, composers, and performer data. I could simultaneously query the **AllClassical** [<http://www.allclassical.com>, part of AllMusic.com], the APC Music Society (Appreciating Classical Music Society), **Classical.net** [<http://www.classical.net>], and Tim's Classical Music Database under the composers category.

One of the most intriguing search tools, created by Ryuichi Iwamura, is **Classical Music Search** [<http://iwamura.home.znet.com/page2.html>], a "melody search engine" with over 1,500 melodic phrases. To use this music-based query feature, a la Music Information Retrieval (see the [sidebar interview](#) with Professor J. Stephen Downie starting on page 44), you need to reconstruct the melody through an onscreen piano keyboard. A successful search presents you with a descriptive list and associated MIDI files, which the search engine found by recognizing a melodic line.

If you use the Mozilla Firefox Web browser, you may have already discovered its ability to add a wide assortment of search engines to the drop-down list. The default list of search engines includes **Gracenote** [<http://www.gracenote.com>], a commercial database with over 4.6 million CDs and 59 million songs. You can use the copy/paste commands to construct discographies.

I also searched for streaming audio content through all the major free audio players: **Windows Media Player** [<http://www.microsoft.com/windows/windowsmedia/mp10/>], **RealPlayer** [<http://www.real.com>], and **WinAmp** [<http://www.winamp.com>]. Real Networks also distributes a free combo player-music download application called **Rhapsody** [<http://www.rhapsody.com>] that lets you download for free and listen to up to 25 songs a month from a database of 1.5 million. Unlike Windows MediaPlayer, and the iTunes player, RealPlayer, WinAmp, and Rhapsody also come in retail versions. The new version of Windows called **Vista** [<http://www.microsoft.com/windowsvista/>], whose consumer release was delayed by Microsoft until January 2007, will include a new version of Windows Media Player connecting to the **Urge** digital music service.

Andante: General Music Guides

The range of music guides on the Internet caters to every taste and genre. Some of these few examples of commercial and free sites even include a database or search engine component.

Grove Music Online [<http://www.grovemusic.com>], a Web-based compilation of three print publications issued by Oxford University Press, is subscription-based, but offers a free trial and online demo. It's an essential resource for anyone studying music history.

Established on the Web in 1995, **AllMusic.com** [<http://www.allmusic.com>], also known as All Music Guide (AMG), describes itself as "the most comprehensive music reference source on the planet. ... All genres and styles of music are covered here, ranging from the most commercially popular to the most obscure. We critique albums and artists within the context of their own genres — from opera to garage rock to traditional country." In terms of content about musicians, the database statistics are truly impressive: 208,731 composers, 78,557 biographies, 66,626 artist images, and a total of 785,395 indexed names. Free registration is required to fully search and browse the site and to sample more than 5.5 million music pieces.

MusicMoz, The Open Music Project [<http://musicmoz.org>] describes itself as "a comprehensive directory of all things music, edited by volunteers. We list, and accept submissions of music-related reviews, articles, factual information, biographies, and websites." Looking over MusicMoz, you'll see that it combines directory and encyclopedia coverage on everything musical, including classical music.

About.com [<http://about.com>], which The New York Times purchased in 2005, contains a series of music guides in its entertainment section organized around genres and musical periods, all compiled by individuals who love to share their knowledge. Lots of advertising, but the sites with live guides are packed with valuable information, insights, and links.

Among the university music library sites I bounced through, I came across several that impressed me. Yale University Music Library offers a comprehensive guide to **Music Resources On The World Wide Web** [<http://www.library.yale.edu/musiclib/webres.htm>]. The University of Washington **Music Library** [<http://www.lib.washington.edu/music/>] also maintains a well-organized set of online, campus-based electronic resources, local databases on music, and a selection of Classical Music News and Blogs. **The Golden Pages: Links for Musicians on the WWW** [<http://www2.rhbc.ac.uk/Music/Links/>] from the Department of Music, Royal Holloway, University of London, covers the entire spectrum of international musical history and is especially rich in the classical music tradition. One of the more useful components of the **Worldwide Internet Music Resources** [http://library.music.indiana.edu/music_resources/], a guide maintained by Indiana University's William & Gayle Cook Music Library, is a location list of music libraries.

Since many motion picture soundtracks use classical music sourced or derived from the original, as well as contemporary classical music, what better way to find movie music than through **Music from the Movies** [<http://www.musicfromthemovies.com>], based on the magazine of the same name? You can search for information about nearly 1,300 composers and almost 2,500 soundtrack reviews. You will need to know your movie titles, however, to find music of a classical bent, because you can only search the reviews by a left-anchored soundtrack title. This is where the **Internet Movie Database** [<http://www.imdb.com>] offering the ability to look up a movie title by keyword comes in handy.

Show Music on Record [<http://www.loc.gov/rr/record/showmusic/>], from the Library of Congress' Motion Picture, Broadcasting and Recorded Sound Division, represents a "revised electronic version of the definitive reference source by Jack Raymond, first published in 1982." The database documents American "commercially-released show music recordings starting with those captured on early cylinders in the late 19th century and continuing through recent compact disc productions of the early 21st century."

First issued in print form in 1981, the **Encyclopedia of Music in Canada** [<http://www.collectionscanada.ca/emc/index-e.html>] migrated to the Web through a partnership with the Library and Archives Canada, which hosts the 1992 second print edition. The Historica Foundation maintains **The Canadian Encyclopedia** [<http://www.thecanadianencyclopedia.com/>] and hosts the current online edition of the EMC.

Legato: Classical Music Guides and Sounds on the Web

Online classical music is readily available through commercial services specializing in the genre and through free Web sites often assembled by dedicated amateur and expert musicologists. Haverford College Library (Pa.) music librarian John Anderies reviewed "The Promise of Online Music" for libraries, covering selected commercial and in-house solutions (**LibraryJournal.com**, June 1, 2005, <http://www.libraryjournal.com/article/CA602662.html>). *The New York Times* reported that the Universal Music Group began offering downloads of live concert recordings through iTunes in late March 2006 (Jepson, *The New York Times*). Universal Music, which owns Deutsche Grammophon, Decca and Philips, also operates a series of English-, German-, and Swedish-language classical music promotional sites at **UniversalClassics.com** [<http://www.universalclassics.com>]; **iClassics.com** [<http://www.iclassics.com>]; **KlassikAkzente** [<http://www.klassikakzente.de>]; also known as **iClassics.de**

[<http://www.iclassics.de>]; and **iClassics.se** [<http://www.iclassics.se>].

The **Classical Music Library** [<http://www.alexanderstreetpress.com/products/clmu.htm>], published by Alexander Street Press as a subscription streaming audio service geared to libraries, features "the largest multi-label catalog of major recording companies, with licenses from nearly 40 music labels to date — including the entire digital catalog from EMI; independents such as Sanctuary Classics, Hyperion, and the CBC." A reference database with background information forms part of the service.

Naxos.com [<http://www.naxos.com>] bills itself as "the world's leading classical music label." It offers an annual subscription service (\$19.95 U.S.) to its entire catalog of more than 7,000 CDs, or, by registering for free, you can listen to one-quarter of each track on all those CDs. The site also features a lot of free background information on classical music, including biographies of each composer represented in its catalog. *Library Journal* listed Naxos in the databases category of Best Reference Sources for 2004.

Classical.com [<http://www.classical.com>], a British subscription streaming audio service with iPod-compatible download files, features "50,000 tracks: 1,900 Composers: 620 Biographies: 5,300 Programme notes: 12,200 Composer images." As a guest, I could search or browse the database and pull up hyperlinked database records. Some composers are also represented by sample MIDI files. Since tracks do not always equate to a single work, the pricing is deceptive: a Mozart four-movement symphony will cost you \$4.46. A quick survey of Mozart CDs at Amazon.com showed me I could buy a new CD (Herbert von Karajan conducting the Berlin Philharmonic recorded on Deutsche Grammophon) with multiple Mozart symphonies for half that cost per symphony.

The **Classical Music Archives** [<http://www.classicalarchives.com>], founded by Pierre R. Schwob in 1994, is a subscription musical performance service, with many pieces free to play (registration required). I could also access a lot of contextual information about some of the most familiar names in the classical music canon. Schwob claims it is "the largest classical music site on the web: 37,213 full length classical music files by 2,002 composers." The annual cost for access to 1,000 files per month and 100 per day is \$25, a fraction of what you would pay by downloading individual tracks at Classical.com or other download services such as iTunes. Audio files are available as free "WMA streams," with no downloading, "hi-fidelity"; MP3 files you can listen to live or download as a subscriber, or as MIDI files.

Launched in 1995, **Classical.net** [<http://www.classical.net>] features more than 3,500 CD/SACD/DVD/Book reviews, as well as 6,000 files and over 4,000 links to other classical music Web sites.

The Duke University Music Library operates **DW3 Classical Music Resources** [<http://www.lib.duke.edu/dw3/>], with over 2,500 descriptive links.

The **Classical Composers Database** [<http://www.classical-composers.org>], established in 1995 by Jos Smeets, documents almost 2,800 composers ranging in time from Saint Ambrose in the 4th century A.D. to 21st-century composers such as Andrew Lloyd Webber.

The **Classical MIDI Connection** [<http://www.classicalmidiconnection.com>], part of a larger site called MIDIWORLD by Les Winters, contains hundreds if not thousands of MIDI sequences created by dedicated individuals for your listening pleasure. This is also a great place to learn about MIDI.

If you want to listen to a classical composer's work and are not too picky about the quality of the performance, **Classic Cat, the Free Classical Catalogue** [<http://www.classiccat.net>] indexes nearly 3,000 free MP3 files, supported by biographical information for some composers and links to other sites.

ClassicOL [<http://www.classicol.com>], based in the U.K., was created by former musician Andrew Tollervey as an encyclopedia of classical music and a gathering place for musicians who wish to have their own Web site under his domain. One of the most useful features here is a list of 155 classical music radio stations that broadcast on the Internet in either the RealPlayer or Windows Media Player streaming audio formats.

Gramophone Magazine's site, **The Gramophone** [<http://www.gramophone.co.uk>], features the Gramofile, "the world's largest archive of classical CDs and reviews," dating back to 1983 and requiring free registration.

La Scena Musicale [<http://www.scena.org>], a bilingual classical music free online and print magazine published in Quebec, Canada, includes a weekly column, The Lebrecht Weekly, by music critic Norman Lebrecht.

The two best resources I came across for learning about contemporary classical music were **Sequenza21, the Contemporary Classical Music Portal** [<http://www.sequenza21.com>], and **NetNewMusic**

[<http://netnewmusic.net>], “a portal for the world of non-pop, contemporary classical/indy/avant-whatever musics.” In addition to daily news and reviews from the field on Sequenza21, I also found composer, performer, and record label blogs, as well as a link to the **S21 New Music Wiki** [<http://netnewmusic.net/wiki/>] shared with NetNewMusic.

If you travel a lot and want to find upcoming classical music and opera performances at your destinations, the **Opus 1 Classical** database [<http://www.opus1classical.com/>] covers over 17,000 current and future concerts. Opus 1 Classical also runs the subscription-based **Opus 1 Classical Music Service** [<http://opus1classical.classical.com>].

The **Database of Recorded American Music** (DRAM) [<http://dram.nyu.edu>], a subscription streaming audio service based at New York University, comprises a core collection of 1,200 CDs from New World Records and other labels specializing in American musical performances, including works from the classical repertoire. As with a few other subscription databases I visited, I could browse and learn about the composers, artists, ensembles, instruments, and record labels, including liner notes.

Staccato: Bach-Mozart-Beethoven

Johann Sebastian Bach (1685–1750), Mozart (1756–1791), and Ludwig van Beethoven (1770–1827) are easily the most recognized names in the classical music canon. Their repertoires ranged from religious to secular, from requiems and masses to heroic symphonies and opera. I selected these sites as among the most important devoted to their lives and works.

Bachanalia

Located opposite the church where Bach served for 27 years, the **Bach-Archiv Leipzig** [<http://www.bach-leipzig.de>] includes a museum, research center, and library. You can view a small number of high-resolution digitized manuscript scores here through the Library > Bach digital link.

The **Johann-Sebastian-Bach-Institut Göttingen** [<http://www.bach-institut.de>] features the Göttinger Bach-Katalog, a “database of the works of Bach and their handwritten Sources till 1850,” a component of which identifies cultural institutions around the world preserving his compositions. You can also view database descriptions of Bach manuscripts held in German repositories, with digitized images attached to some of the records.

Naturally, **J. S. Bach** [<http://www.jsbach.org/>] has his own Web site, courtesy of Jan Hanford and Jan Koster, who gave him an Internet presence in 1995. The centerpiece of their work is a catalog of Bach’s compositions, based on several versions of the Bach-Werke-Verzeichnis (BWV), available in print and through other sites such as Robert Poliquin’s **Musique et musiciens** [<http://infopuq.quebec.ca/~uss1010/musique.html>].

Aryeh Oron offers the most comprehensive look at Bach’s vocal works through his misleadingly named **Bach Cantatas Website** [<http://www.bach-cantatas.com>]. University of Vermont professor Z. Philip Ambrose translated all of Bach’s vocal works into English, which you can consult at **J.S. Bach: Texts of the Complete Vocal Works with English Translation and Commentary** [<http://www.uvm.edu/~classics/faculty/bach/>]. Between them, these two sites link to all other sites about these compositions.

Yo Tomita at Queen’s University Belfast’s School of Music maintains the **Bach Bibliography for the Global Community of Bach Scholars** [<http://www.music.qub.ac.uk/~tomita/bachbib/index.html>], the most inclusive research resource for Bach studies assembled by an individual: 22,422 references as of March 11, 2006.

Finally, one of the more unusual sites devoted to this composer is Teri Noel Towe’s **The Face of Bach** [<http://www.npj.com/thefaceofbach/>], which traces the lineage and mysteries of known Bach portraits.

Mozartmania

Since Mozart was born in Salzburg, Austria, it should come as no surprise that the city revels in its image as home to one of the greatest composers of European classical music. The **Internationale Stiftung Mozarteum Salzburg** (International Mozarteum Foundation Salzburg) [<http://www.mozarteum.at>], with a trilingual site (German, English, Japanese), cares for four buildings associated with Mozart’s life in Salzburg. The picture database with a drop-down subject list, part of an archive in his birthplace building, is a worthwhile stop if you’re looking for images, as is the Bibliotheca Mozartiana, a bibliography of 10,000 writings about Mozart dating back to 1993. For earlier publications about him, you’ll have to find the six in-print volumes issued by the foundation between 1976 and 1998.

The most complete database of Mozart's output and one of the best sites to link out to even more Mozartmania on the Web is found on the trilingual Austrian **Neue Mozart-Ausgabe** site [<http://www.nma.at>].

As its 250th birthday present, the British Library created Mozart's Musical Diary, a portion of a composition catalog Mozart maintained. The diary, with 30 pages and 75 musical introductions performed by the Royal College of Music, forms part of the library's innovative, award-winning, **Turning the Pages** virtual exhibit series [<http://www.bl.uk/onlinegallery/ttp/ttpbooks.html>].

The enthusiasm with which many individuals take up the cause of Mozart is evidenced throughout **The Mozart Project** [<http://www.mozartproject.org>], created by Steve Boerner as an encyclopedic examination of Mozart.

Beethovenum

Beethoven-Haus Bonn [<http://www.beethoven-haus-bonn.de>] incorporates a museum and research center situated in Bonn, Beethoven's birthplace. The Digital Archives, filled with "music manuscripts, first editions, letters and pictures" preserved by the institution, integrates "more than 5,000 documents on 26,000 coloured scans of high quality, 1,600 audio files (music examples, audio letters) and 7,600 text files."

The Ira F. Brilliant Center for Beethoven Studies, San Jose State University, in addition to preserving a lock of Beethoven's hair, also maintains the **Beethoven Bibliography Database** [<http://www.sjsu.edu/depts/beethoven/database/database.html>], "a fully-indexed bibliography of published (and selected unpublished) materials relating to Ludwig van Beethoven." The staff vet user submissions. As for the hair, follow its odyssey through **Beethoven's Hair** [<http://www.beethovenshair.ca>] from the time it was clipped from his body in 1827 until its auction in 1994 by Sotheby's and arrived at its new home at the center.

The best parts of Dominique Prevot's comprehensive, multilingual **Ludwig van Beethoven's Website** [<http://www.LvBeethoven.com>] are the list of Beethoven's compositions, 138 pieces the composer identified by opus numbers, integrated with MIDI audio files and selectively linked with other information on his site, along with references to many other sites about Beethoven. Peter Harrison's **Beethoven Reference Site** [<http://www.kingsbarn.freeseerve.co.uk>] is a comparable site in English and German. A few sample MIDI files are available, but he requires registration to access MP3 files on his site.

The Unheard Beethoven [<http://www.unheardbeethoven.org>], from Wisconsin lawyer Mark S. Zimmer and Dutch computer programmer Willem, presents over 200 MIDI files of Beethoven pieces that are "seldom heard," which they created from scores found with the help of a curator at the Ira F. Brilliant Center for Beethoven Studies. One of the incomplete scores, a piano sonata finished and converted to MIDI by Willem, premiered to a live audience on April 9, 2006, performed by pianist Massimo Anfossi in Turin, Italy, as part of a music festival.

Vivace: The Silent and Sound Databases of Music

A number of databases documenting historic and contemporary compositions and performances include an audio component. These few examples are arranged in a rough chronological order by either musical style or recording technology:

Assembled by University of Florida Music History Professor Jennifer Thomas, the **Motet Database Catalogue Online** [<http://www.arts.ufl.edu/motet/contents.asp>] describes 33,000 religious motets and masses referenced in manuscripts and printed anthologies that appeared between 1475 and 1600.

Likely the largest such compilation on the Web, **The Lied and Art Song Texts Page** [<http://www.recmusic.org/lieder/>] from Canadian computer programmer Emily Ezust, contains a staggering "18,053 texts used in Lieder and other classical Art Songs (Kunstlieder, Mélodies, Canzoni, Romansy, Canciones, Liederer, Canções, Sânger, Laulua, etc.) as well as in many choral works and other types of classical vocal pieces (28,331 settings and growing). Several thousand translations to English, French, German, Spanish and other languages are also offered."

The Colonial Music Institute published an online edition of the **Early American Secular Music and Its European Sources, 1589–1839: An Index** [<http://www.colonialdancing.org/Easmes>] compiled by Robert M. Keller, Raoul F. Camus, Kate Van Winkle Keller, and Susan Cifaldi. The database, originally published on microfiche as *The National Tune Index*, contains more than 75,000 records drawn from European and American publications and manuscripts. According to the introduction, the database entries include information that permits statistical analyses of how music tastes have changed over 250 years.

Among the best sites devoted to opera that link to other opera history and opera recording sites is **Capon's Lists of Opera Recordings** (CLOR) [<http://operadis.info/CLORLINK.HTM>], which also includes a discography of 14,000 opera recordings chiefly organized by composer. Opera lovers will also appreciate the hard work over the past decade that Robert Glaubitz has put into **The Aria Database** [<http://www.aria-database.com>]. In addition to documenting 170 operas, 60 composers, and 1,278 arias, his contributors have provided over 200 MIDI files. For locating opera performances broadcast on the Internet, there's no better source than **Opera Broadcasts on the Internet** [<http://www.operacast.com>]. Hungarian Tamás Máray keeps a list of over 200 opera companies around the world at the **Opera Schedule Server** [<http://www.fsz.bme.hu/opera/main.html>]; the database of opera performances is not available.

Inventing Entertainment: The Motion Pictures and Sound Recordings of the Edison Companies

[<http://memory.loc.gov/ammem/edhtml/edhome.html>], American Memory, Library of Congress, offers 81 examples of the earliest surviving disc phonograph recordings of prolific American inventor Thomas Alva Edison (1847–1931).

The Cylinder Preservation and Digitization Project [<http://cylinders.library.ucsb.edu>] from the University of California, Santa Barbara Library, Department of Special Collections, offers a database of more than 5,000 digitized cylinder recordings. Audio listening choices for each recording include a QuickTime audio stream (Web plug-in required) and downloadable MP3 and unedited 24-bit WAV files.

Emile Berliner and the Birth of the Recording Industry [<http://memory.loc.gov/ammem/berlhtml/>], American Memory, Library of Congress, brings together resources, including 108 recordings, on Emile Berliner (1851–1929), who perfected the microphone and transformed the recording industry with disc phonographs. Berliner's flat-disc recording technology eventually displaced the cylinder recording method used by Edison and other companies. Through a roundabout way, Berliner also introduced the world to the endearing image and trademark of the dog Nipper listening to "His Master's Voice" (HMV) from a gramophone.

The Virtual Gramophone: Canadian Historical Sound Recordings

[<http://www.collectionscanada.ca/gramophone/>] from Library and Archives Canada, documents over 12,000 78-rpm recordings, with more than 4,200 available for downloading as either MP3 or RealAudio files. As a bonus, the site also has educational resources, including biographies of Canada's musical talent from the 1900s to the 1940s.

Ritardando: Digital Classical Music Research in Academic Institutions

Outside of the entire Music Information Retrieval field, likely the most ambitious and publicly well-funded digital music library project within the U.S. is Indiana University's **Variations2** [<http://variations2.indiana.edu/research/>]. This project "aims to establish a digital music library testbed system containing music in a variety of formats, involving research and development in the areas of system architecture, metadata standards, component-based application architecture, and network services. This system will be used as a foundation for digital library research in the areas of instruction, usability, human-computer interaction, and intellectual property rights." For the moment, the Mac and Windows client-server software is only available within the university's network. Some public domain scores that do not require the Variations2 software for viewing are accessible at the original **Variations Prototype: Online Musical Scores** site [<http://www.dlib.indiana.edu/variations/scores/>].

Stanford University's Center for Computer Assisted Research in the Humanities [<http://www.ccarh.org>] developed **MuseData: An Electronic Library of Classic Music Scores** [<http://www.musedata.org>] and other innovative tools for encoding, analyzing, and interacting with digital representations of classical music. Full access to MuseData content requires registration. Other remarkable databases here that offer public access include **Themefinder** [<http://www.themefinder.org>] and **KernScores** [<http://kern.ccarh.org>], "a library of virtual musical scores in the Humdrum ****kern** data format," or 5,070,559 notes in 21,042 files, including downloadable MIDI and other digital music file formats.

Gordon J. Callon, Acadia University (Canada), edits the Acadia Early Music Archive

[<http://ace.acadiau.ca/score/archive/ftp.htm>], an FTP archive of digital facsimiles in various formats of works by composers who mainly lived in the 17th and 18th centuries.

Brent Yorgason, a Ph.D. candidate in the Department of Music Theory, Jacobs School of Music, Indiana University, created the New Music Database: American Concert Music Since 1980

[<http://theory.music.indiana.edu/newmusic/>], which includes contemporary classical music. The individual records include a link to the subscription encyclopedic database, Grove Music Online.

Fine (The End)

Various music critics and commentators have talked about the impending death of European classical music. As noted by *The New York Times*, "the 1.4 million downloads of free Beethoven symphonies offered by BBC Radio 3 last June [2005] proved that audiences for classical music might be larger than anyone thought" (Jepson, *The New York Times*). The article also pointed out that even though digital music downloads in all genres increased in 2005 by 150 percent, "digital downloads still account for only 6 percent of the overall music market."

I believe the passion by performers to make music and the ease of access to public domain compositions, which the Internet has only increased, will outlast sporadic periods of disquietude and declining support for the European classical music canon. Musicians, classical or otherwise, are nothing if not adaptable to changing times and economic circumstances. If the 19th century was shocked by Beethoven's Symphony No. 3 ("Eroica"), I can imagine what some Londoners must feel when they read on BBC News that the Glyndebourne opera house staged *School 4 Lovers*, a hip-hop version of Mozart's *Così fan tutte* for his 250th birthday [<http://news.bbc.co.uk/1/hi/entertainment/4817388.stm>]. When in doubt, as the old saying goes, enjoy the show (and these Web sites)!

The author's opinions do not necessarily reflect those of his employer.

Music Information Retrieval: An Interview with J. Stephen Downie

J. Stephen Downie, Associate Professor, Graduate School of Library and Information Science, University of Illinois, Urbana-Champaign, co-organized the first interdisciplinary pre-conference meeting around the topic of Music Information Retrieval (MIR) in August 1999. In an article with Joe Futrelle ("Interdisciplinary Research Issues in Music Information Retrieval: ISMIR 2000–2002," *Journal of New Music Research*, vol. 32, no. 2, 2003, pp. 121–131), MIR was defined as follows:

a rapidly growing interdisciplinary research area encompassing computer science and information retrieval, musicology and music theory, audio engineering and digital signal processing, cognitive science, library science, publishing, and law. Its agenda, roughly, is to develop ways of managing collections of musical material for preservation, access, research, and other uses. In this way it resembles traditional library science, and indeed, libraries have historically led the development of music collections. The idea of applying automatic information retrieval (IR) techniques to music dates back to the 1960's (Kassler, 1966). But in particular, MIR has grown recently out of an explosion of interest in networked collections of musical material in digital form, precipitated by the development of compression technologies such as mp3, online services such as Napster, advances in optical musical recognition (OMR), and the ever-plummeting costs of digital storage and bandwidth. In this sense MIR is closely related to Digital Libraries.

MIR researchers have met on an annual basis since 2000. The **7th International Conference on Music Information Retrieval (ISMIR 2006)** [<http://ismir2006.ismir.net>] will convene in October 2006 in Victoria, BC, Canada. Downie, who maintains **music-ir.org: Virtual Home of Music Information Retrieval Research** [<http://www.music-ir.org>], which includes the Music Information Retrieval Bibliography database with electronic documents, consented to answer a few questions about his experiences with MIR and its future.

Do you have a background as a musician? If not, how did you become interested in music information retrieval (MIR) research?

In Grade 7 I became fascinated by classical and baroque music. In particular, I was intrigued by how cleverly it was all put together with overlapping melodies and constantly shifting harmonies. I started taking private music theory and history lessons then and continued all through high school. I continued my music studies at the University of Western Ontario's (UWO) Faculty of Music, where I majored in music theory and composition (1984–1988).

During my senior year, I had to prepare for a formal examination on my flute-playing abilities. I was a terrible flautist (no talent and never practiced properly). I decided to find some easy-to-learn Bach that I heard at a recital. Using the traditional OPAC was a lost cause as I only had a snippet of the "Adagio" section floating about in my head. Ever try singing into an OPAC? Not much happens! It was only after the hours-long intervention of the remarkable music librarians at UWO that we were able to determine that the piece in question was Bach's Sonata in C (BWV 1033). The whole experience really opened my eyes as to how much of our musical heritage is potentially unfindable because of the lack of *music-based* searching tools.

Between 1998 and 1992 I drove a taxi in London, Ontario. (What else does one do with a music theory degree?) Over these 4 years I kept in touch with faculty and friends at UWO and continued to ponder how we might actually create music-based searching tools. One of my taxi customers convinced me to apply to UWO's School of Library and Information Science (SLIS). In 1992 I began my Master of library and information science. The dean of the school was also interested in the music searching problem and generously provided opportunities for me to begin my formal

investigations. After garnering the support of the dean, the rest is history. I was able to pursue deep-level investigations of music information retrieval issues during my Ph.D. years at SLIS (1993–1999), which culminated in my thesis on the evaluation of a simple, yet effective, approach to searching collections of folk songs using traditional text retrieval technologies applied to N-grams of monophonic melodic intervals.

What are some of the significant achievements in the MIR field since the first International Symposium on Music Information Retrieval (ISMIR) in 2000?

I convened the [pre-conference] 1999 workshop on MIR because I was lonely. It was not clear to me who else might be interested in MIR research. We had about 35 people at the 1999 workshop. I made some very important (and long-lasting) connections then. One very important connection was Dr. Don Byrd, who is now at Indiana University. Dr. Byrd and I decided to join forces to hold a larger, more formal, meeting of MIR researchers. Dr. Byrd had funding and was working at the University of Massachusetts Amherst. This is why the first International Symposium on Music Information Retrieval (ISMIR) was convened at Plymouth, Mass. We had about 90 attendees at that first ISMIR.

Since then, the ISMIR conferences have been located in places like Bloomington, Ind.; Paris; Baltimore; Barcelona; and London, United Kingdom. Upon reflection, there are three things that impress me the most about the MIR community.

First, the MIR community is truly international, which is one of its greatest strengths, as it brings a wide variety of cultural perspectives to bear on MIR challenges.

Second, I am pleasantly surprised by amazing growth in interest in MIR research. For example, the ISMIR 2005 meeting in London, U.K., had to turn people away because the large lecture hall had reached its legal capacity!

Third, and most importantly, I am simply awestruck by the vast number of clever approaches people are exploring to create music-based retrieval systems. Some are building “Query-by-Humming” systems where you hum a melody as your search statement. Others are building “Query-by-Example” systems where the computer analyses a submitted music file (MP3, etc.) and goes off and finds similar-sounding pieces. Another set of researchers are investigating notation-based systems wherein a user “writes” out a melodic fragment as the search statement. Still others are combining social knowledge research on how users actually mix, match, and share their collections (i.e., playlists) with the other sophisticated techniques mentioned above.

What parts do XML and databases play in MIR?

XML plays several roles in the MIR world. First, you must realize that there are three main streams of MIR research: audio (MP3, WAV, etc.), symbolic (scores, notes, etc.), and social (user-generated playlists, etc.). XML plays a big role on the symbolic side of MIR, as several of the important score representation systems are XML-based. Michael Good’s MusicXML is one such representation. The social-side researchers are using XML to describe the user-generated metadata associated with individual pieces and playlists.

What are data to knowledge (D2K) and text to knowledge (T2K)? What is their relationship to music to knowledge (M2K) and MIR?

D2K and T2K together represent a suite of machine learning tools developed by the National Center for Supercomputing Applications (NCSA) Automated Learning Group (ALG) at the University of Illinois at Urbana-Champaign (UIUC). For those not familiar with machine learning (ML), the basic idea is that you give an ML program a collection of items within some known sets of properties and then the ML tries to “learn” rules about why the items belong to a particular set. The classic example is e-mail spam. In this case, you give the ML program a collection of e-mails that have been grouped into “spam” or “not spam” sets. The ML program then analyses the “features” of each group and comes up with a “model” for recognizing e-mail as “spam” or “not spam.” Using this model, new never-seen-before e-mail is similarly analyzed and the ML program “decides” whether or not it is spam.

On the music front, imagine that you have music in your MP3 collection that you can group into “like” and “hate.” Further imagine that you want to build up your collection, but do not want to spend hundreds of hours sorting through millions of songs to make sure you do not get any more pieces that you hate. What you need is a kind of personal music “spam” filter. To accomplish this, you will need an ML program that knows how to analyze the “features” found in music audio files. M2K represents the set of music analysis tools that plug into the D2K/T2K suite so you can prototype such sophisticated music-based ML applications as artist identifiers, genre classifiers, and, of course, personal music spam filters.

Interested readers are directed to an M2K demonstration video that makes this much clearer: <http://www.music-ir.org/m2kvid/>

Are there public benefits, as opposed to scholarly ones, that will emerge from MIR?

Here at the University of Illinois, a new startup company called One Llama Media, Inc. has formed around the researchers that developed D2K/T2K/M2K. The goal of the company is to build a user-friendly MIR system that combines the power of audio-based ML programs with the social knowledge of music lovers to a comprehensive music discovery and management environment. In my opinion, the One Llama approach is uniquely positioned to make a huge impact on the future of MIR because of its emphasis on bringing together both the technological and human experience aspects of MIR system development.

To summarize, MIR research is based on the premise that we need to search for music as music. That is, we need to analyze and index the music itself in order to build systems that give us the same kind of access to music that Google gives to text. When we can do this quickly and efficiently, we will be able to discover unknown relationships between pieces, learn about new kinds of music, and organize our collections in many novel ways.

An Internet Audio and XML Glossary

The Internet audio world is a little more complex than the consumer-oriented radio and recording industry. This short glossary will have you speaking like an Internet audiophile in no time.

* **AAC** (Advanced Audio Coding), also known as MPEG-2 Part 7 and MPEG-4 Part 3, is the compressed audio file format used by Apple iTunes media and iPod players.

* **MIDI** (Musical Instrument Digital Interface), as its name implies, allows electronic and computer-based musical instruments to communicate with one another. MIDI is also a file format (.MID).

* **MP3** is the compressed audio file format used for podcasts and other Internet audio delivery services, including streaming audio. MP3, short for MPEG Layer-3, is a proprietary format jointly developed in Germany beginning in 1987 and achieving ISO acceptance in 1992.

* **MP4** see AAC.

* **Ogg** is an open source and free multimedia file format developed in response to the introduction of MP3 format licensing by its German owners. Its development is guided by the Xiph Foundation [<http://www.xiph.org/ogg/>].

* **Streaming audio** refers to audio content that's delivered live through streaming content servers. The three major free audio file players — Windows Media Player, RealPlayer, and WinAmp — all recognize various kinds of streaming audio. Icecast [<http://www.icecast.org>] is an open source, streaming audio server compatible with Nullsoft's Shoutcast format; Nullsoft created Winamp. The online book by Kerry Cox, *Icecast Installation and Management: A Guide to Open Source Audio Streaming* [<http://www.gnuware.com/icecast/>], is a useful introduction to streaming audio.

* **WAV** (Waveform Audio) is an uncompressed audio file format jointly developed by IBM and Microsoft. Audio CDs originally used the WAV format.

* **WMA** (Windows Media Audio) is a Microsoft proprietary format developed as an alternative to MP3. Windows Media Player and WinAmp, along with many other kinds of portable players, can play this format.

The Cover Pages at OASIS, edited by Robin Cover, on **XML and Music** [<http://xml.coverpages.org/xmlMusic.html>] provide an excellent historical overview of various XML schema involving music. The most recent link, however, was 3 years old when the page was last revised in February 2006.

The Digital Sheet Music Parade

These few exemplary digitized sheet music collections are devoted to or contain classical music. (For a scholarly perspective on the utility of digitized collections of sheet music, see "Evaluation of Web Access to Historical Sheet Music Collections and Music—related Iconography" by Maurice B. Wheeler and Mary Jo Venetis, *First Monday*, vol. 10, no. 10, October 2005, http://firstmonday.org/issues/issue10_10/wheeler/index.html.)

The **Sheet Music Consortium** [<http://digital.library.ucla.edu/sheetmusic/>], hosted by the University of California Los Angeles' Digital Library Program, brings together cataloging data on sheet music from seven sources,

including the Library of Congress. A search for all titles in all collections between 1500 and 1923 produced 78,265 hits.

Harvard University's Eda Kuhn Loeb Music Library is creating one of the most impressive public access digital facsimile collections of **Digital Scores** [<http://hcl.harvard.edu/libraries/loebmusic/collections/digital.html>] consisting chiefly of manuscript and printed works by Bach, Mozart, and Giuseppe Verdi.

Pianopedia [<http://www.pianopedia.com>], created by Eric Brisson, is a database of "classical piano repertoire" that references 5,260 works by 863 composers. You can systematically browse through an individual composer's works and view or download digitized scores.

The University of Rochester's Sibley Music Library maintains a collection of nearly 800 public domain **Musical Scores** and anthologies [<https://dspace.lib.rochester.edu/handle/1802/292>] stored as PDF files.

The **Werner Icking Music Archive** [<http://icking-music-archive.org>] features an excellent and long list of free sheet music sites, with the majority of the scores downloadable as PDF files.

I even found a search engine, somewhat limited in scope, for free sheet music called **Fac-similé.org** [<http://www.fac-simile.org>]. Both the Music Library Association's **Sheet Music Collections** [<http://www.lib.duke.edu/music/sheetmusic/collections.html>], compiled by Lois Schultz at Duke University Library, and my British Columbia Digital Library section on **Songs and Music** [<http://www.bcdlib.tc.ca/links-subjects-songsandmusic.html>], will take you to many more digitized sheet music sites.

For some free software to use in viewing, playing, or creating sheet music, try:

- Scorch, a Web browser plug-in from **Sibelius** [<http://www.sibelius.com>], whose SibeliusMusic site claims to be the world's largest source of "new scores on the web" (52,332 when I visited).
- **Finale Notepad** [<http://www.finalemusic.com/notepad>] from MakeMusic, Inc., a sheet music composition tool with audible feedback, but no MIDI file export capability.
- **Anvil Studio** [<http://www.anvilstudio.com>], a MIDI composer, with the free version also letting you record up to a one-minute audio track (WAV format). You can purchase additional software components that enhance the application's utility.
- **8notes.com** [<http://www.8notes.com>], which offers free sheet music, also features a free online MIDI Converter through which you can upload a MIDI file and transform it into sheet music.

Classical Music Blogs

Since blogs generally link to other blogs on the same topic, these choices will take you to a network of worthwhile classical music blogs.

The Music section of **ArtsJournal.com** [<http://www.artsjournal.com/music/>], edited by Douglas McLennan, "formerly an arts columnist and arts reporter with the Seattle Post-Intelligencer and the Seattle Weekly," offers a rich assemblage of daily news and articles on music from around the world. ArtsJournal also hosts a series of blogs on music and the music business, including **Sandow: Greg Sandow on the Future of Classical Music** [<http://www.artsjournal.com/sandow/>]; he's best known as a music critic for *TheWall Street Journal*. In 2004 ArtsJournal also hosted **Critical Conversation: Classical Music Critics on the Future of Music, A 10-Day AJ Topic Blog** [<http://www.artsjournal.com/cc/>].

The **Top 10 Sources** [<http://toptensources.com>] is similar to blog anthologies or blog carnivals and the About.com site, where a dedicated individual assembles collection of blogs or individual posts on a regular basis. Two blog anthologies worth following here are both edited by Mackenzie Chan: **Top 10 Sources for Classical Music** [<http://classical-music.toptensources.com>] and **Top 10 Sources for Opera** [<http://opera.toptensources.com>].

Alex Ross, music critic of *The New Yorker*, maintains a self-titled blog, **Alex Ross: The Rest Is Noise** [<http://www.therestisnoise.com>]. Like Greg Sandow's online diary, Ross' blog also serves as a sounding board for his book-in-progress. Anastasia Tsioulcas, *Billboard Magazine's* classical music columnist, writes his mind at **Café Aman** [<http://cafeaman.blogs.com>].

Bart Collins centers **The Well-Tempered Blog** [<http://pianophilia.blogspot.com/>] around piano and classical music, while the **OperaBlog** [<http://www.operacast.com/blogger.html>], for "Discussion of opera (the music genre, NOT the web browser] and internet opera broadcasts," comes from E. H. and G. S. Riggs of OperaCast.com.

TABLE 1: AUDIO FILE SEARCH RESULTS ON SEVEN SEARCH ENGINES

Searches conducted on March 23, 2006
 "Family" filters were turned off

Search Engine	URL	Format	Keywords	Results	Available Search Options	Search Results Notes
AlltheWeb.com Audio	http://www.alltheweb.com	In keyword	MP3: classical	109,463	Search term prefixes MP3: & audio: are equivalent	
AltaVista Audio	http://www.altavista.com/	audio/MP3	classical	34,148	File size and date WAV, WMA, Real, AIFF, Other, Durations: all, > & < 1 minute	"More info" hyperlink may reveal more detailed metadata
ez2find	http://ez2find.com/channel/advanced_search.php?meta=Music	MP3	classical	10	None	
ez2find	http://ez2find.com/channel/advanced_search.php?meta=Music	MIDI	classical	105	None	
Google	http://www.google.com	N/A	MP3 classical	31,100,000		Usage Rights: not filtered by license; free to use or share; free to use or share, even commercially; free to use, share or modify; free to use, share or modify, even commercially
Lycos Audio	http://www.lycos.com	N/A	MP3 classical	55	None	Includes MP3 file link & duration
				"25 Groups of Pages containing 111 MIDIs, grouped by length"; "13 Groups of	Song title or Band nameSort	A search sorted by length returned zero

Music Robot <http://www.musicrobot.com> MIDI only Eine kleine
Nachtmusik Pages containing 111 MIDIs, grouped by name"; "85 Pages containing these MIDIs" [show all] by length; sort by name; show all; length (bytes). results because all the MIDI files were less than 400 bytes.

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[New Blog from ITI - Intelligent Agent by Robert Berkman - www.ia-blog.com](#)

[The New OPL Sourcebook A Guide for Solo and Small Libraries; By Judith A. Siess - order now!](#)