The Music Information Retrieval Evaluation eXchange (MIREX): An Introductory Overview

http://music-ir.org/mirexwiki

J. Stephen Downie

Graduate School of Library and Information Science

University of Illinois at Urbana-Champaign

jdownie@uiuc.edu

My Life: A Bunch of Acronyms

- IMIRSEL: International Music Information Retrieval System Evaluation Laboratory
- HUMIRS: Human Use of Music Information Retrieval Systems
- M2K: Music-to-Knowledge
- MIREX: Music Information Retrieval Evaluation eXchange
- NEMA: Networked Environment for Music Analysis

What is MIR?

- Born ca. 1960’s in IR research
- Major recent growth precipitated by advent of networked digital music collections
- Informed by multiple disciplines and literatures
- ISMIR started in 2000

Defining Music Information Retrieval?

- Music Information Retrieval (MIR) is the process of searching for, and finding, music objects, or parts of music objects, *via* a query framed musically and/or in musical terms

- *Music Objects*: Scores, Parts, Recordings (WAV, MP3, etc.), etc.
- *Musically framed query*: Singing, Humming, Keyboard, Notation-based, MIDI file, Sound file, etc.
- *Musical terms*: Genre, Style, Tempo, etc.

What makes MIR so tricky?

Music information is:

- Multifaceted
- Multimodal
- Multirepresentational
- Multiexperiential
- Multicultural

Given the inherent complexities of music information, only a multidisciplinary research approach could possibly lead to the development of a robust MIR system.

Multifaceted (Pt. 1)

- Pitch
  - Pitch is “the perceived quality of a sound that is chiefly a function of its fundamental frequency in --the number of oscillations per second ” (Randel 1986)
  - Also, the distance between pitches: intervals
- Temporal
  - Meter, duration, rhythm, tempo, etc.
- Harmonic
  - When two or more pitches occur at the same time, a simultaneity, or harmony, occurs. Also known as polyphony, while absence of polyphony is called monophony.

Multifaceted (Pt. 2)

- Timbre
  - Tone-colour
  - Flute v. Kazoo v. Violin v. Bass Drum
- Editorial
  - Fingerings, Ornamentation, Dynamic instructions (e.g., ***ppp***, ***p,*** ...***f***, ***fff***), Slurs, Articulations, *Stacatti*, Bowings, etc.
- Textual
  - Lyrics, *Libretti*
- Bibliographic
  - Title, Catalogue Num., Composer, Publisher, Lyricist, etc.

Multirepresentational (Pt. 1)

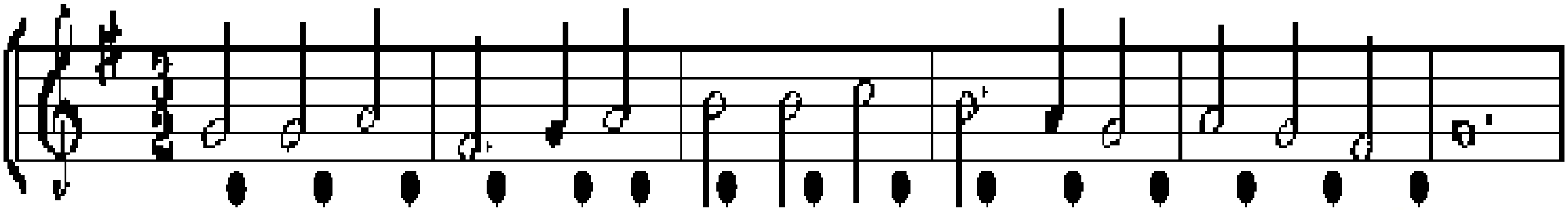
- Solfege
  - do, re, mi, fa, so, etc.
- Pitch names
  - A, B, C, D, E, F#, A^b, etc.
- Chord Names
  - Cmaj, Dmin, Am7, etc.
- Scale Degree
  - I, II, III, IV, V, VI, VII
- Interval
  - +1, 0, -3, -8, +6, etc.

Multirepresentational (Pt. 2)

- MIDI Events:

12:1:000	key	7	G6	100	190
12:2:000	key	7	G6	100	190
12:3:000	key	7	A6	100	190
12:4:000	key	7	F#6	100	286
13:1:096	key	7	G6	100	94
13:2:000	key	7	A6	100	190

- Graphic Score:



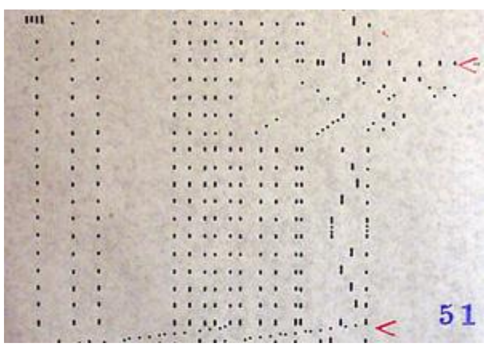
ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

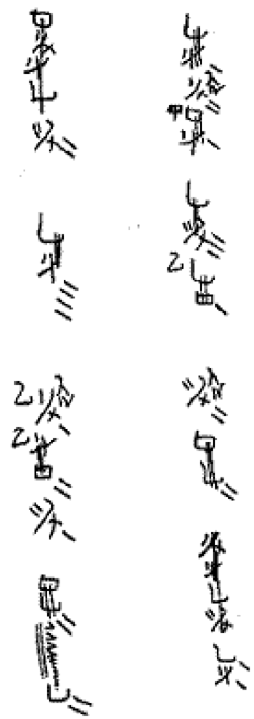
National Science Foundation
WHERE DISCOVERIES BEGIN

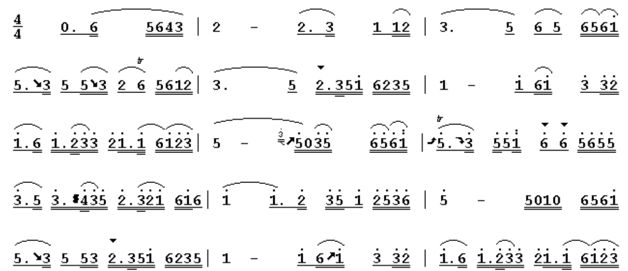
THE ANDREW W. MELLON FOUNDATION

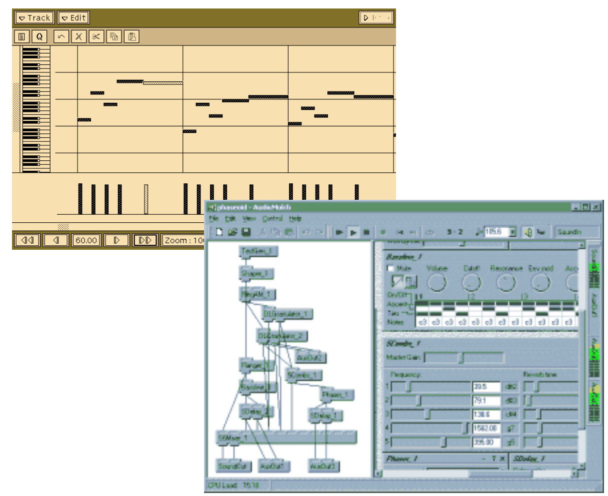
imirsel

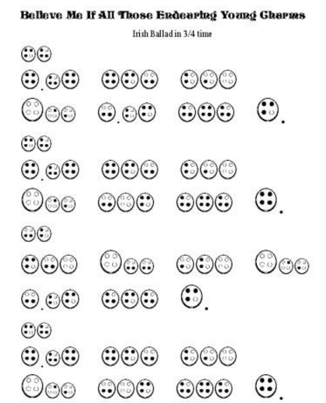
Music representation is VERY heterogeneous!











ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
National Science Foundation WHERE DISCOVERIES BEGIN
THE ANDREW W. MELLON FOUNDATION
imirsel

Multimodal

- Music as thought
  - Tune running through head
- Music as auditory events
  - Sound waves hitting eardrums
  - Sound in electromechanical formats
    - WAV, MP3, AU, CD, LPs and Tapes
- Music as graphic language
  - Symbolic representations
    - Scores
    - MIDI files and other discrete encodings
    - etc.

Multiexperiential (Pt. 1)

- Music as object of study
  - Perform, Analyze
- Music as foreground
  - Concert going, Deliberate audition
- Music as background
  - Movie scores, Shopping malls, Housecleaning
- Music social signifier
  - Protest, Peace, Group songs, “Brow-ness”: High, Middle, Low, etc.

Multiexperiential (Pt. 2)

- Music as *aide memoire*
  - Soundtrack recordings, Camp songs, War songs, Ballades, etc.
- Music as tradition
  - Hymns, Folksongs, Nursery songs, etc.
- Music as drug
  - Stimulation
    - Stay awake, Frenzied dancing, etc.
  - Relaxation
    - Stress relieve, Forgetfulness, Sleep, etc.
  - Seduction

Multicultural

- Different notation/representational schemes
  - E.g., Modern art music
- Lack of notation/representational schemes
  - E.g., Jazz (improvised), Aural and oral traditions
- Different scales and modes
  - E.g., Quartertone music, Gamelan music, Eastern music
- Different grammars of musical affect and gesture
  - E.g., Inuit throat music, Indian ragas
- Different accessibility to recordings and recording technologies

The “Brass Ring” MIR System

- Multimodal, Multirepresentational, Multicultural
- Has a meaningful abstracting/thumbnail feature for determinations and browsing
- Employs an intelligent, user-definable, ***experientially-grounded,*** relevance-feedback/classification mechanism:
  - User inputs “song” into system and can tell system which aspect(s) of the music (e.g., throbbing bass, sweet violins, tempo, rap-like vocals, etc.) is/are the key factor(s) that should be the basis for gathering similar items
  - Would overcome user input errors

MIREX Model

- Based upon the TREC approach:
  - Standardized queries/tasks
  - Standardized collections
  - Standardized evaluations of results
- Not like TREC with regard to distributing data collections to participants
  - Music copyright issues, ground-truth issues, overfitting issues

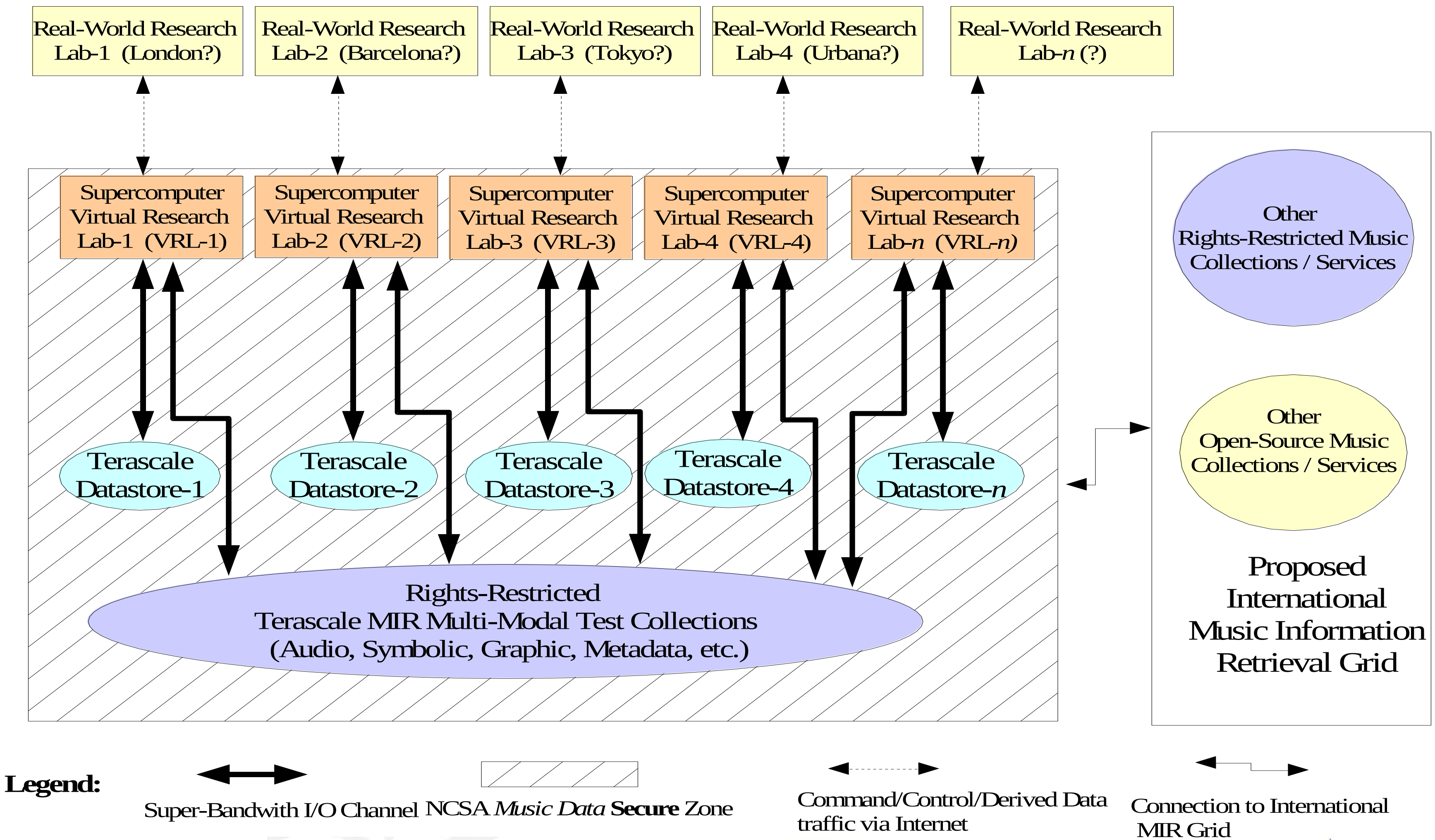
Audio Description Contest

- Barcelona 2004
- Music Technology Group (Dr. Serra's Lab)
- Contest Categories
  - Genre Classification/Artist Identification
  - Melody Extraction
  - Tempo Induction
  - Rhythm Classification
- MIREX built upon the lessons learned by ADC

IMIRSEL: First Principles

1. Security for the music materials
2. Accessibility for international, domestic and internal researchers
3. Sufficient computing and storage infrastructure for the computationally- and data-intensive MIR/MDL techniques examined

Virtual Research Labs Model



Music-to-Knowledge (M2K)

- Goal: Have both a toolset and the evaluation environment available to researchers
- Visual data flow programming built upon NCSA's Data-to-Knowledge (D2K) machine learning environment
- Java-based thus easily portable
- Supports distributed computing

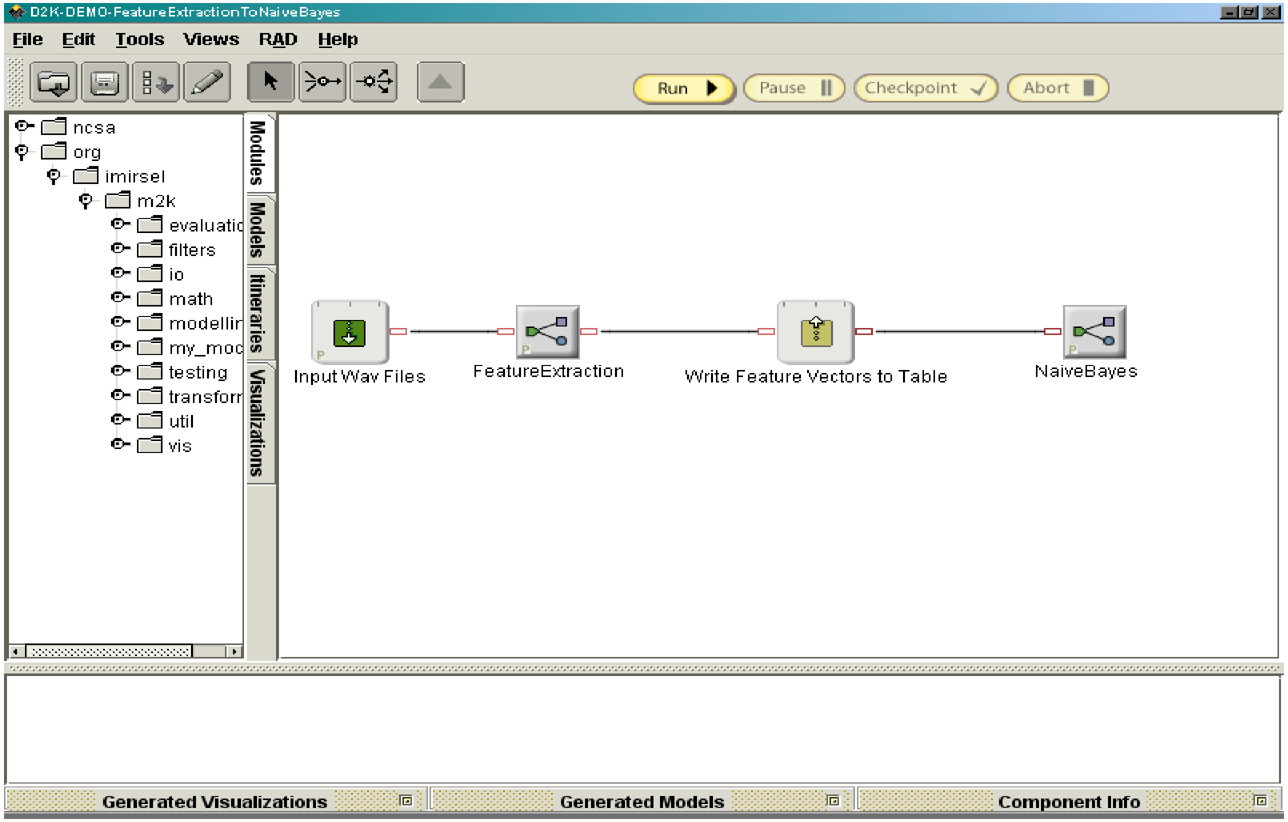
M2K: Main Goals

- Promote collaboration and sharing through a common, modular toolset
- A ‘black box’ approach to provide commonly needed algorithms for fast prototyping
- Alleviate the ‘reinventing the wheel’ problem

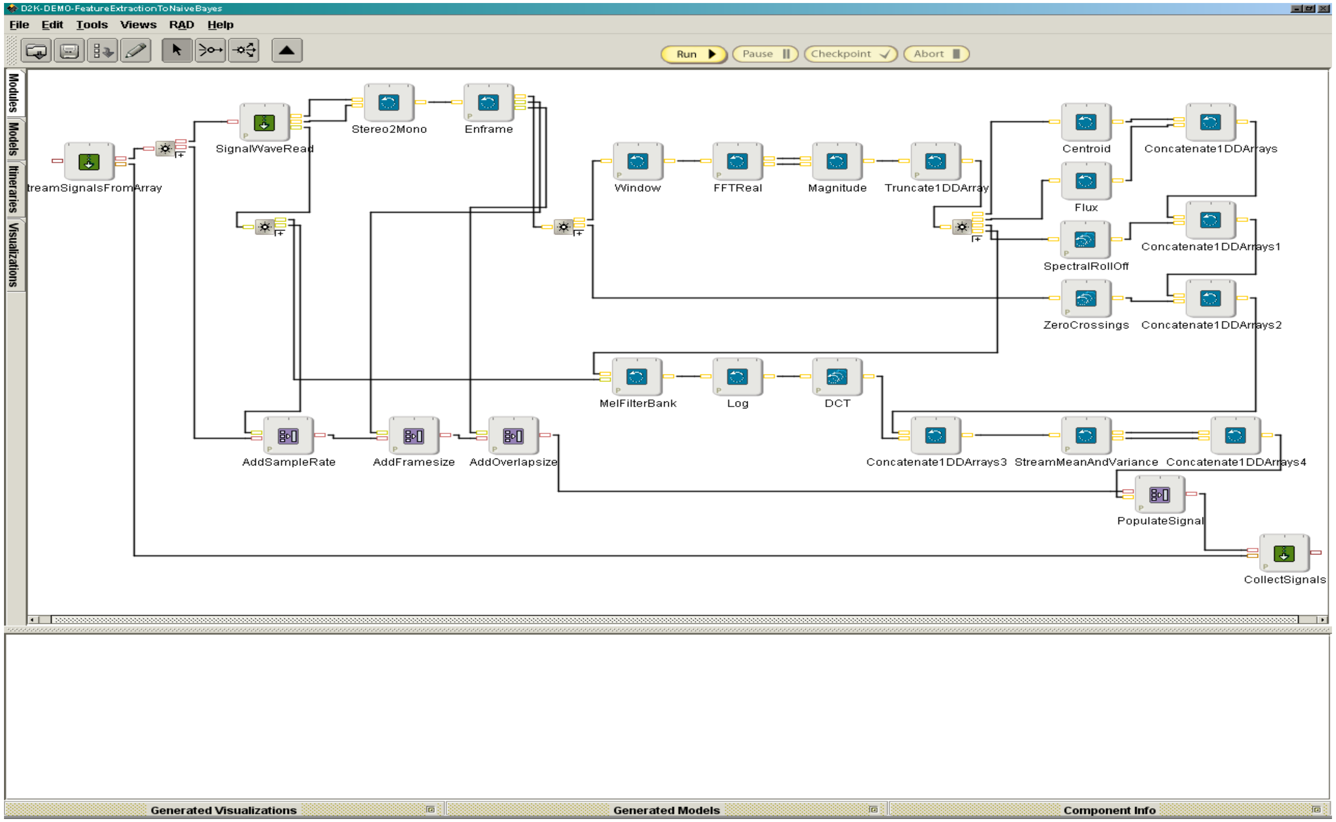
How M2K/D2K Works

- Signal processing and machine learning code is written into *modules*
- Modules are ‘wired’ together to produce more complicated programs called *itineraries*
- Itineraries can then be run or used themselves as modules allowing *nesting* of programs
- Individual modules and nested itineraries can be assigned to be *parallelized* across all machines in a network, or to individual machines in a network

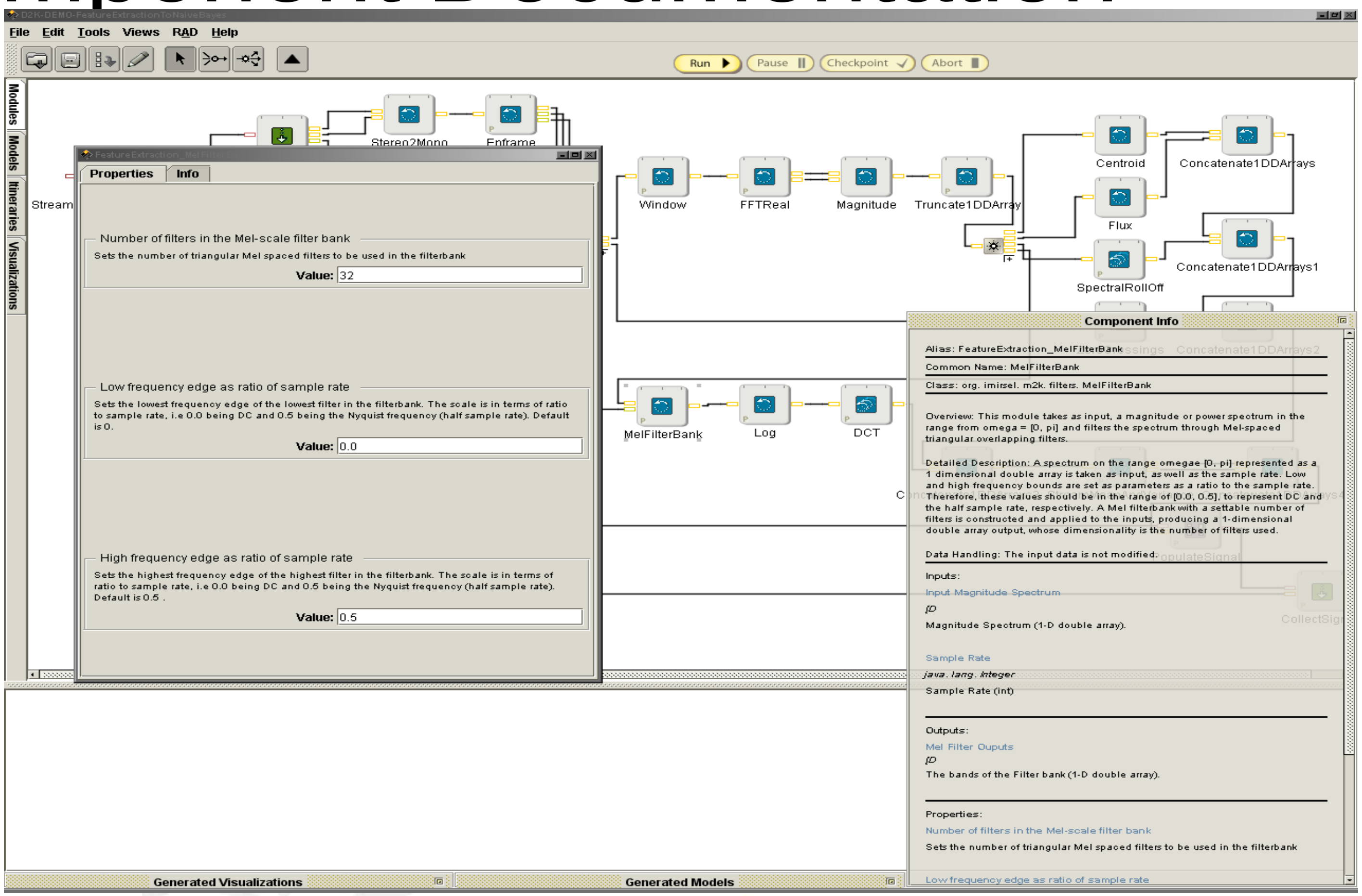
A Picture is Worth 1000 Words: Music Classifier Example



Music Classifier Example: Feature Extraction Nested Itinerary



Editing Parameters and Component Documentation



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

National Science Foundation
WHERE DISCOVERIES BEGIN

THE ANDREW W. MELLON FOUNDATION

imirsel

MIREX Overview

- Began in 2005
- Tasks defined by community debate
- Data sets collected and/or donated
- Participants submit code to IMIRSEL
- Code rarely works first try ☺
- Huge labour consumption getting programmes to work
- Meet at ISMIR to discuss results

Audio Description Contest

- Barcelona 2004
- Music Technology Group (Dr. Serra's Lab)
- Contest Categories
  - Genre Classification/Artist Identification
  - Melody Extraction
  - Tempo Induction
  - Rhythm Classification
- MIREX built upon the lessons learned by ADC

MIREX Summary Data

	2005	2006	2007	2008
Number of Tasks (includes Sub-tasks)	10	13	12	18
Number of Runs	86	92	122	168

TASK	05	06	07	08
Audio Artist Identification	7		7	11
Audio Beat Tracking		5		
Audio Chord Detection				15*
Audio Classical Composer ID			7	11
Audio Cover Song Identification		8	8	8
Audio Drum Detection	8			
Audio Genre Classification	15		7	26*
Audio Key Finding	7			
Audio Melody Extraction	10	10 *		21*
Audio Mood Classification			9	13
Audio Music Similarity		6	12	
Audio Onset Detection	9	13	17	
Audio Tag Classification				11
Audio Tempo Extraction	13	7		
Multiple F0 Estimation			16	15
Multiple F0 Note Detection			11	13
Query-by-Singing/Humming		23 *	20 *	16*
Query-by-Tapping				5
Score Following		2		3
Symbolic Genre Classification	5			
Symbolic Key Finding	5			
Symbolic Melodic Similarity	7	18 **	8	

Runtime Extremes!

- Audio Melody Extraction

- Fastest : 56 Seconds
- Slowest: 5 Days

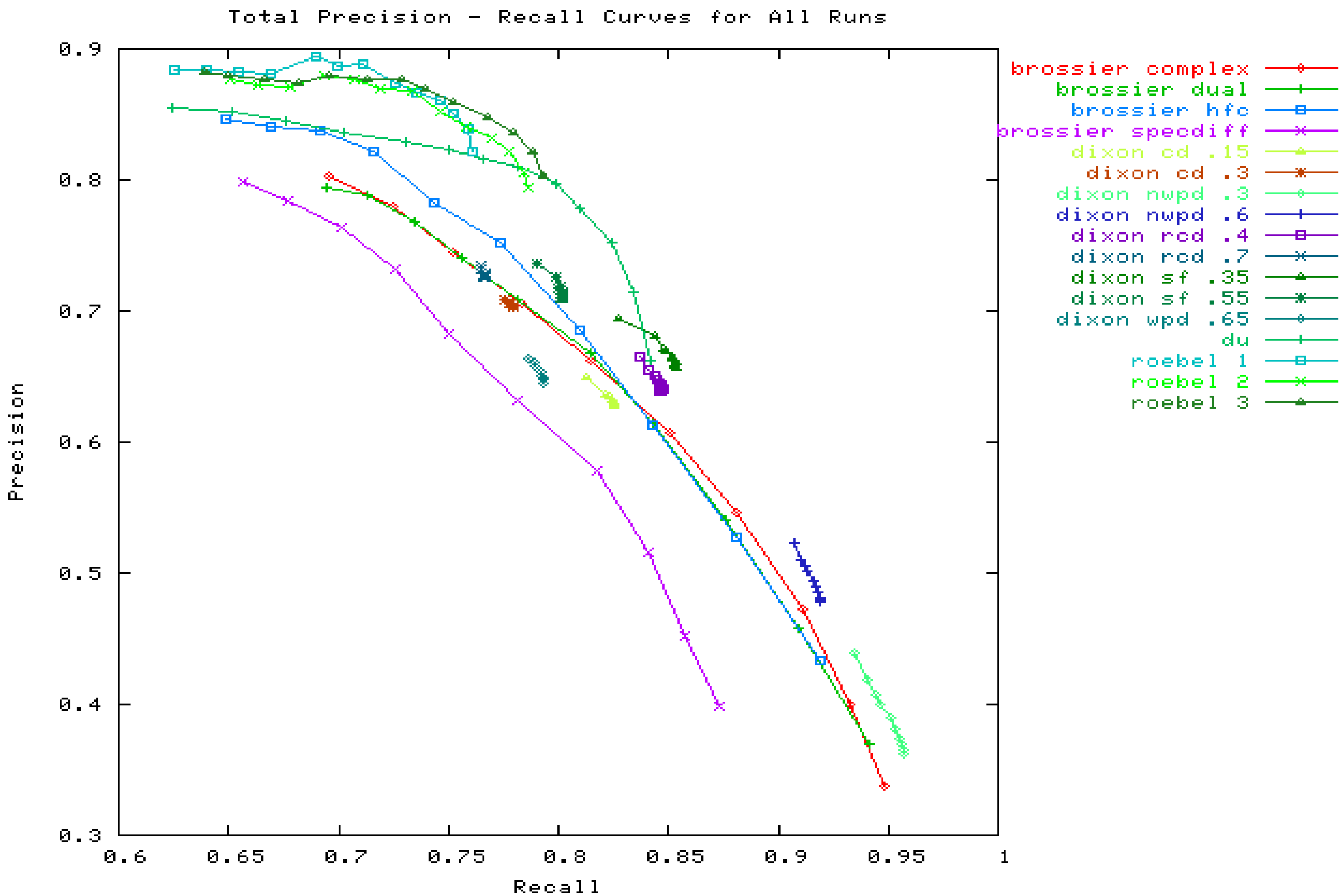
Some Innovation Highlights

- Some New Tasks
  - Audio Cover Song
  - Audio and Symbolic Similarity
  - Mood Classification
- New Evaluations
  - Multiple parameters in Onset Detection
  - Evalutron 6000: Human similarity judgments
  - Friedman and Tukey's HSD tests

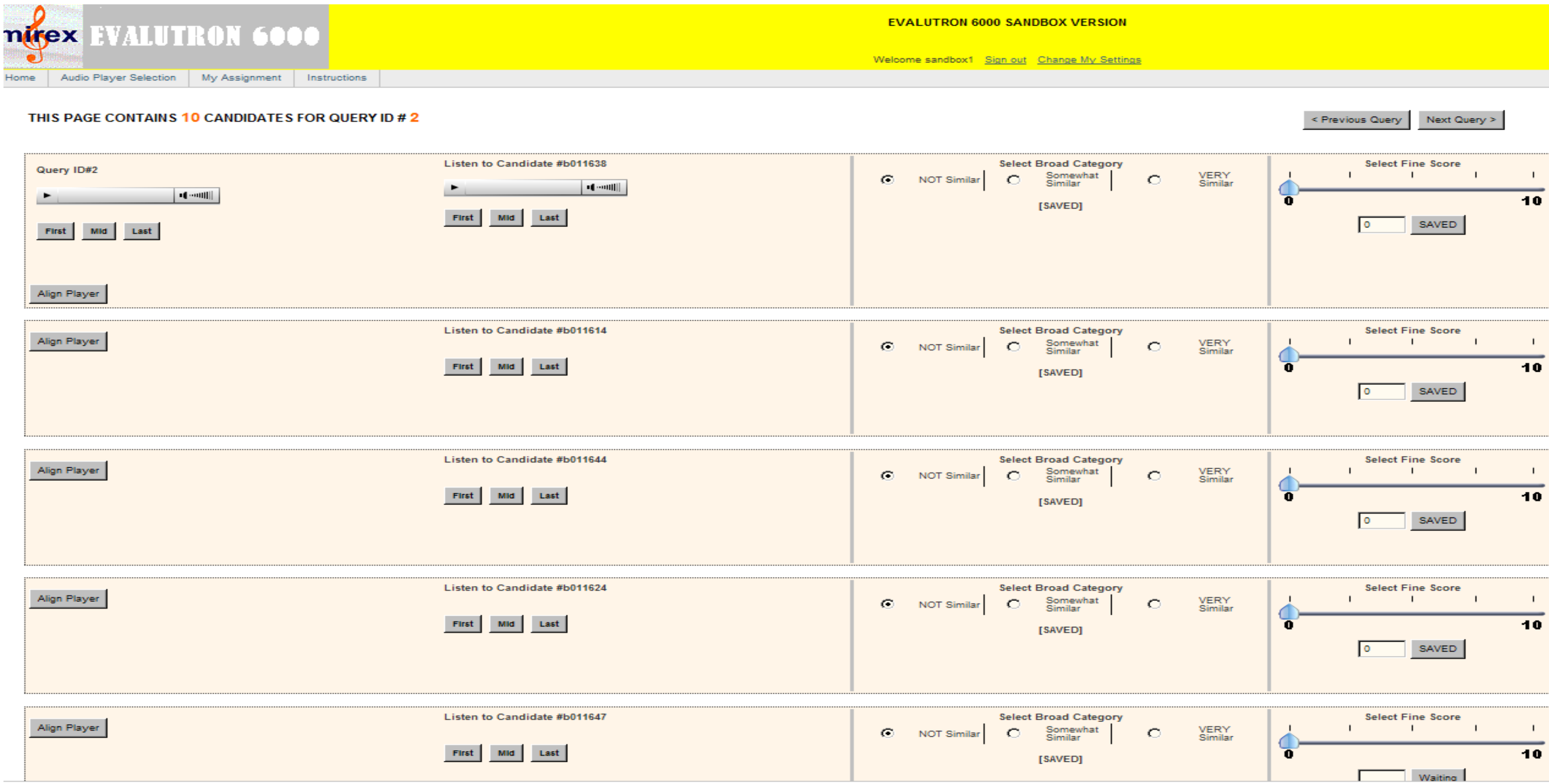
Some 2008 Highlights

- Some New Tasks
  - Audio Chord Detection
  - Audio Tag Classification
  - GenreLatin Sub-task
  - Query-by-Tapping
  - New Melody Extraction 2008 Set
- New Evaluations
  - Expanded Friedman and Tukey's HSD tests

Onset Detection



Evalutron 6000



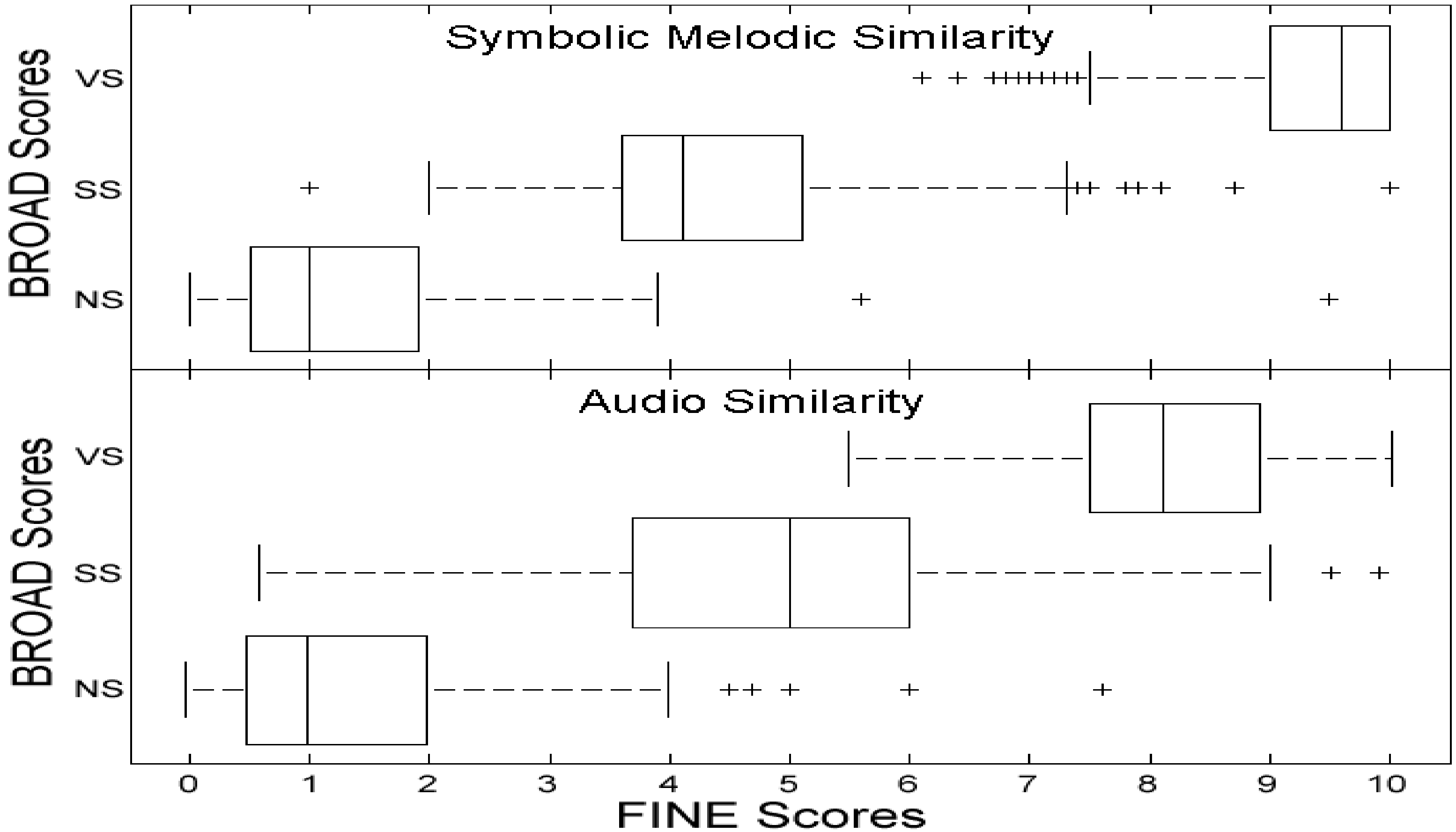
Evalutron 6000

	Audio Similarity	Symbolic Similarity
# Graders	24	21
# Graders per Q/C pair	3	3
# Queries per grader	7-8	15
Size of Candidate lists	Max 30	15
# Of Q/C pairs evaluated per grader	Max 240	225
# Of queries	60	17

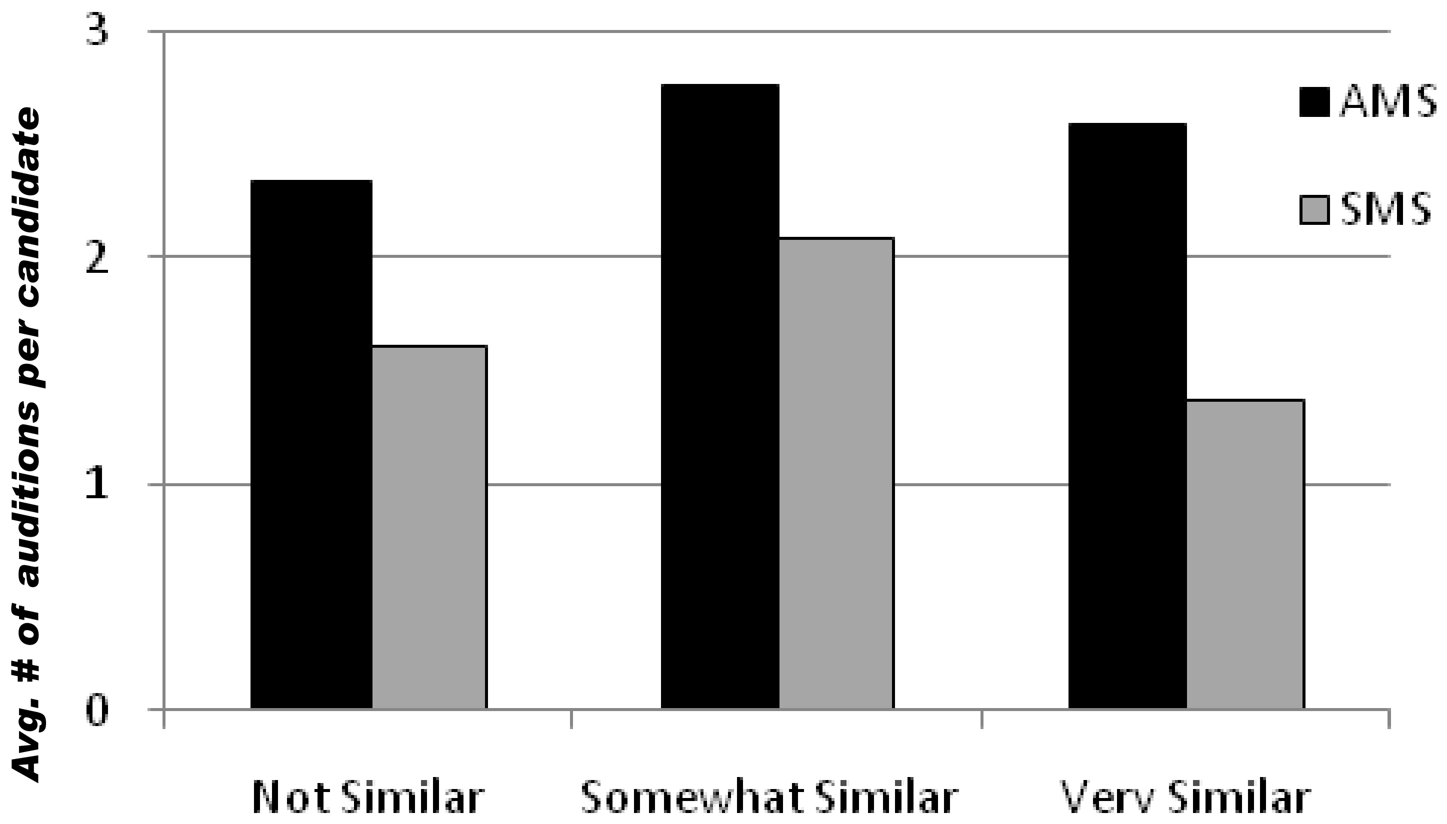
Evalutron 6000 Data

	SMS	AMS
No. of events logged	23,491	46,254
No. of submitted algorithms	8	6
Total no. of queries	17	60
Total no. of query-candidate pairs	905	1,629
No. of graders	21	24
No. of queries per grader	15	7-8
Avg. size of candidate lists	15	27
Avg. no. of evaluations per grader	225	205

Scoring Distributions



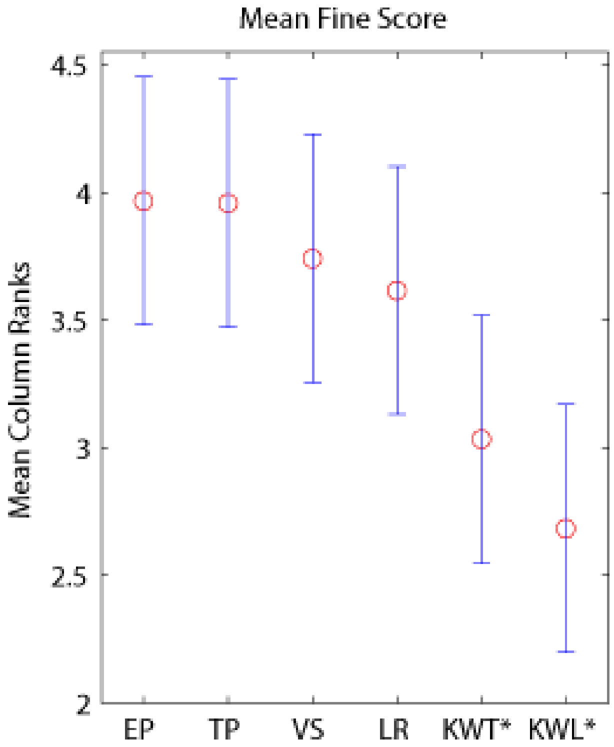
Differences in Evaluator Effort



Friedman Tests

Audio Music Similarity and Retrieval

Friedman's ANOVA Table					
Source	**SS**	**df**	**MS**	**Chi-Sq**	**Prob>Chi-Sq**
Columns	84.733	5	16.947	24.291	0.000
Error	961.767	295	3.260		
Total	1046.50	359			



Friedman’s Test:
Tukey’s HSD Multiple Comparisons

TeamID	TeamID	Lowerbound	Mean	Upperbound	Significance
EP	TP	-0.963	0.008	0.980	FALSE
EP	VS	-0.755	0.217	1.188	FALSE
EP	LR	-0.630	0.342	1.313	FALSE
EP	KWT	-0.030	0.942	1.913	FALSE
EP	KWL	0.320	1.292	2.263	TRUE
TP	VS	-0.763	0.208	1.180	FALSE
TP	LR	-0.638	0.333	1.305	FALSE
TP	KWT	-0.038	0.933	1.905	FALSE
TP	KWL	0.312	1.283	2.255	TRUE
VS	LR	-0.847	0.125	1.097	FALSE
VS	KWT	-0.247	0.725	1.697	FALSE
VS	KWL	0.103	1.075	2.047	TRUE
LR	KWT	-0.372	0.600	1.572	FALSE
LR	KWL	-0.022	0.950	1.922	FALSE
KWT	KWL	-0.622	0.350	1.322	FALSE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
National Science Foundation
WHERE DISCOVERIES BEGIN
THE ANDREW W. MELLON FOUNDATION
imirsel

HSD Comparisons of Top Submissions

Comparison		Task						
Rank	**Rank**	**ACS06**	**AMS06**	**QBSH06**	**ACS07**	**AMS07**	**QBSH07**	**SM07**
1	2	**TRUE**	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
1	3	**TRUE**	FALSE	FALSE	**TRUE**	FALSE	FALSE	FALSE
1	4	**TRUE**	FALSE	FALSE	**TRUE**	FALSE	**TRUE**	FALSE
2	3	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
2	4	FALSE	FALSE	FALSE	FALSE	FALSE	**TRUE**	FALSE
3	4	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
National Science Foundation
WHERE DISCOVERIES BEGIN
THE ANDREW W. MELLON FOUNDATION
imirsel

Enter NEMA

- Originally entitled: “Pan-Galactic-Distributed-Music-Analysis-Tools-Project-With-No-Clever-Name”
  - Tie-ins with Software Environment for the Advancement of Scholarly Research (SEASR)
  - UIUC, McGill (CA), Goldsmiths (UK), Queen Mary (UK), Southampton (UK), Waikato (NZ)
  - 1 January 2008 to 31 December 2010
    - Funded 11 December 2007 (Yippee!)

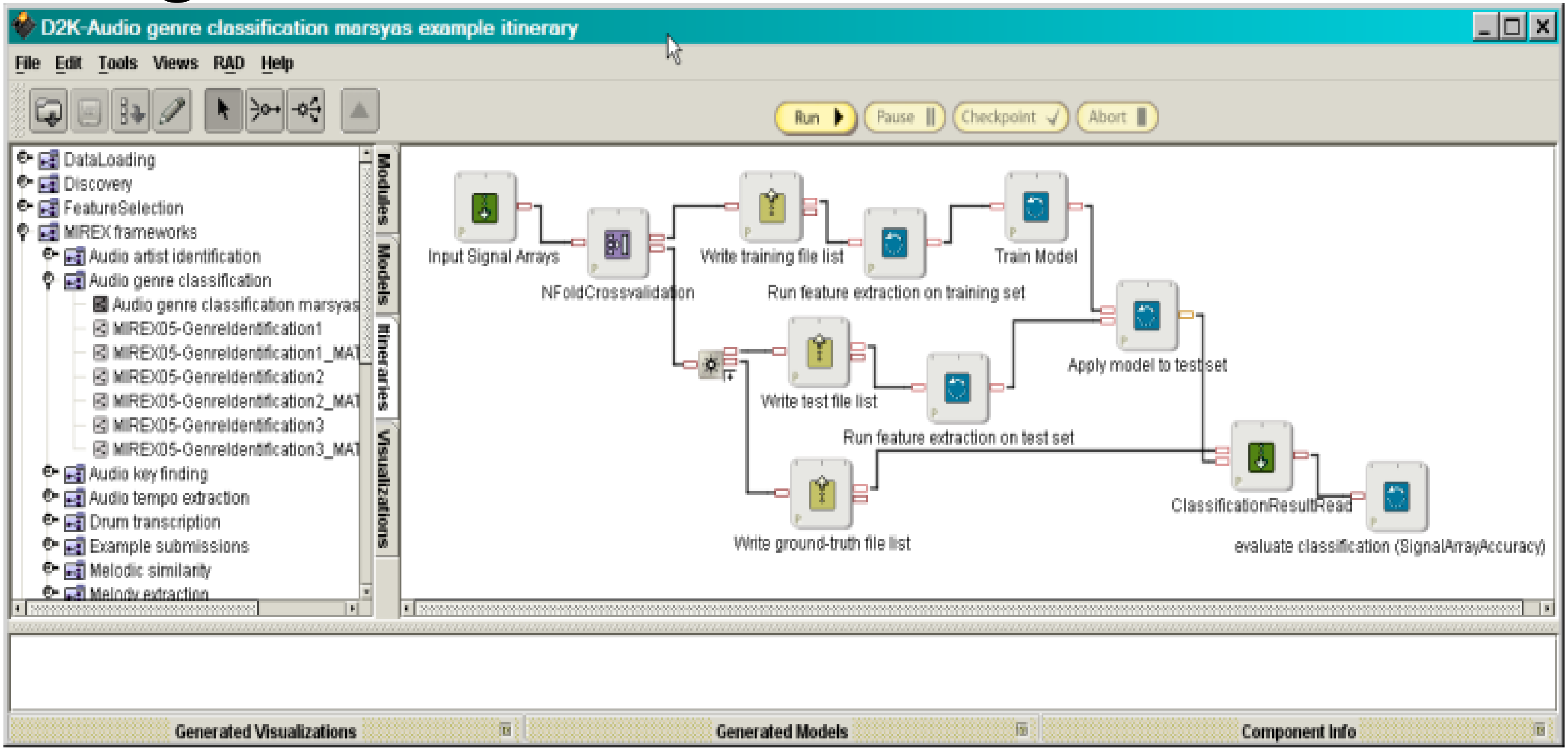
Example Consideration

- Music classification (artist, genre, etc) is often broken down into a *feature extraction* followed by a *machine learning* stage
- Some researchers focus only on one stage or the other
- Difficult to evaluate the success of approaches in this case
- Ideally, would evaluate all feature extractors against all classifiers

Integrating Other Tools

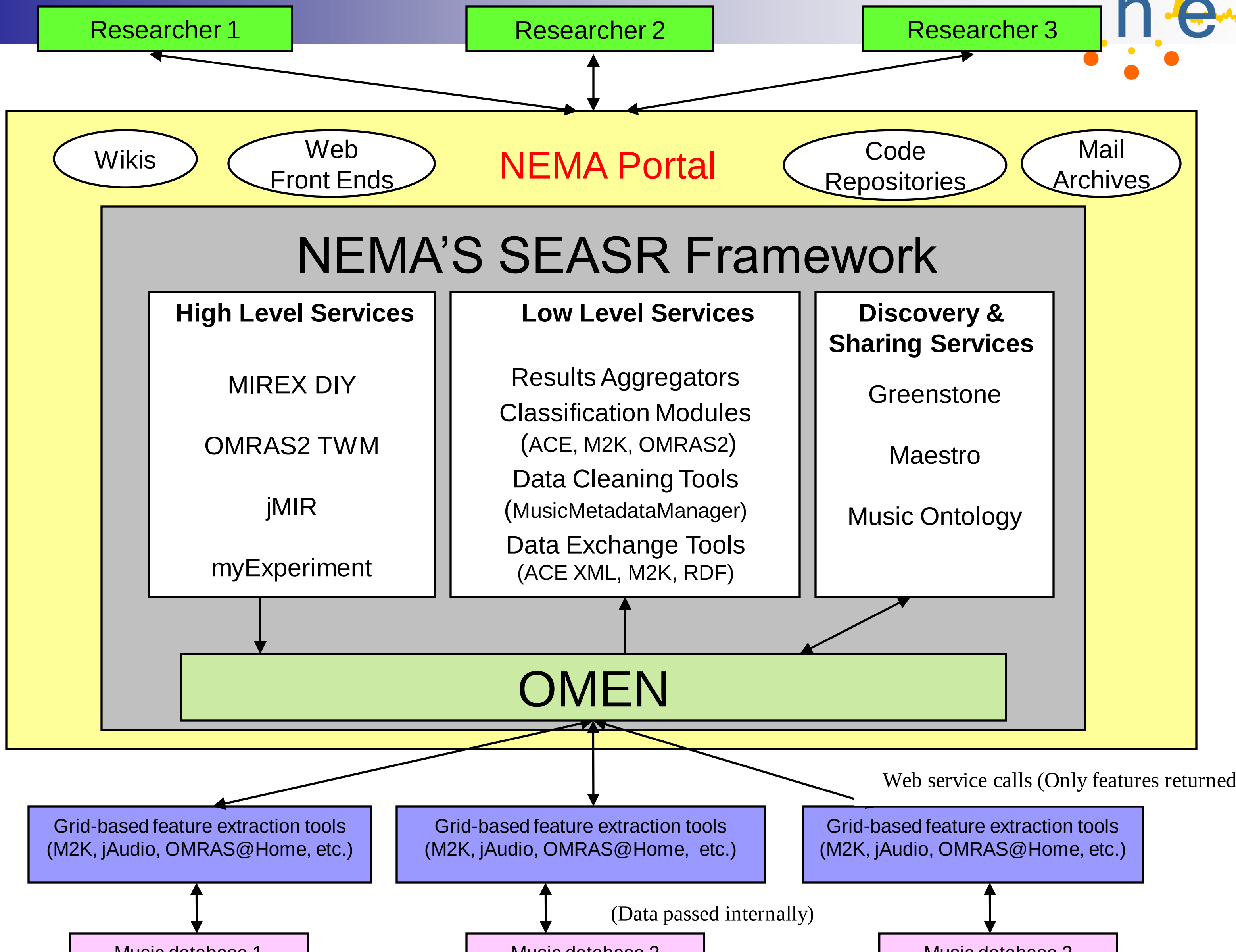
- Must also provide a means of support for all the other toolsets people use
  - MATLAB, Marsyas, Weka, Clam, ACE, and on and on
- External integration modules allow for non-M2K or JAVA-based programs to be used
  - E.g. C/C++ compiled binaries, MATLAB, etc
- External processes called through the Java runtime environment

An External Classification Algorithm



NEMA Vision

- In the new NEMA reality, for example, it should become common place for researchers at **Lab A** to easily build a virtual collection from **Library B** and **Lab C**, acquire the necessary ground-truth from **Lab D**, incorporate a feature extractor from **Lab E**, amalgamate the extracted features with those provided by **Lab F**, build a set of models based on pair of classifiers from **Labs G** and **H** and then validate the results against another virtual collection taken from **Lab I** and **Library J**. Once completed, the results and newly created features sets would be, in turn, made available for others to build upon.



ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

National Science Foundation WHERE DISCOVERIES BEGIN

THE ANDREW W. MELLON FOUNDATION

imirsel

The Amazing……

mirex do it yourself web service BETA

MIREX DIY Demonstration - Mozilla Firefox

http://cluster3.lis.uiuc.edu:8080/mirexdiydemo/index.jsp

Welcome to the MIREX DIY Demonstration

A recent article in *D-Lib Magazine* is a good introduction to what we are trying to accomplish:

Downie, J. Stephen. 2006. The Music Information Retrieval Evaluation eXchange (MIREX). In *D-Lib Magazine 12* (Issue 12). Available: http://dlib.org/dlib/december06/downie/12downie.html.

Available Itineraries

Please check out the demonstration itineraries below. To best see what is happening, please use Firefox as your browser with javascript turned "on". Without Firefox and javascript you might have to manually "reload" the pages to see current events as the jobs run. Actually, Internet Explorer does not work very well at all.

DEMO - Matlab Key Finder
: An audio key finding experiment using a Matlab-scripted algorithm run under the MIREX DIY Service.

DEMO - Single Gaussian MFCC (M2K 1.2)
: A music classification experiment based on a single Gaussian classifier using MFCCs extracted from audio files.

DEMO - Marsyas Classification Experiment
: A music classification experiment using the Marsyas bextract feature extraction library run under the MIREX DIY Service.

DEMO - J48 MFCC (M2K 1.2 + Weka)
: A music classification experiment based on the Weka J48 decision tree classifier using MFCCs extracted from audio files.

DEMO - LDA MFCC (M2K 1.2)
: A music classification experiment based on a Linear Discriminant Analysis (LDA) model using MFCCs extracted from audio files.

DEMO - CART MFCC (M2K 1.2)
: A music classification experiment based on a Classification Regression Tree (CART) using MFCCs extracted from audio files.

DEMO - Feature Extractor
: A simple audio feature extractor. Look at the "features.csv" file in the "jobs" directory.

MIREX Project Leader : J. Stephen Downie (jdownie@uiuc.edu)
The International Music Information Retrieval Systems Evaluation Laboratory (IMIRSEL)

Dr. Downie and the IMIRSEL team are supported by the Andrew W. Mellon Foundation and the National Science Foundation (NSF) under Grant Nos. NSF IIS-0340597 and NSF IIS- 0327371.

Done

Run Itinerary - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/mirexdiydemo/viewItin.jsp?id=21

mirex do it yourself web service BETA

Home | View Job Queue | MIREX Wiki | MIREX 2005 Results Poster | MIREX 2006 Results Poster

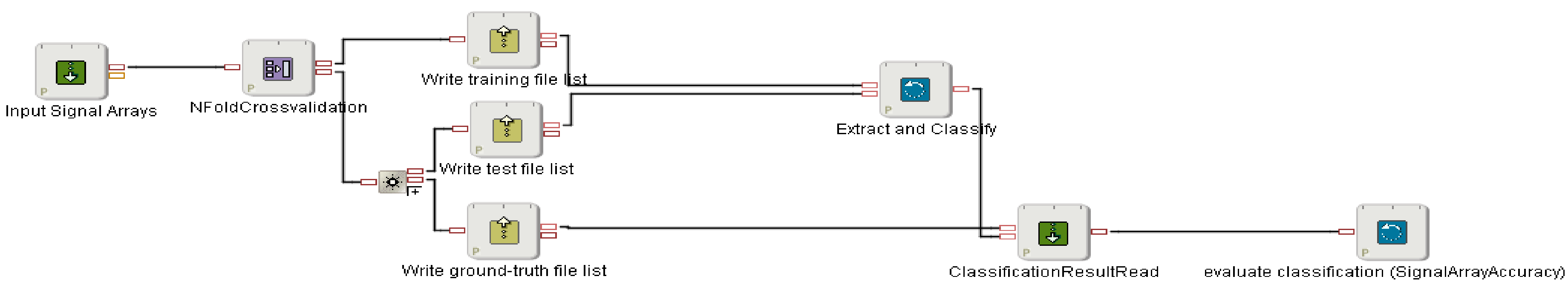
Itinerary Details:

Itinerary ID	21
Name	DEMO - Marsyas Classification Experiment
Description	A music classification experiment using the Marsyas bextract feature extraction library run under the MIREX DIY Service.
Num. Processors	1

Run this itinerary

Itinerary Image(s)

marsyas.png



Done

Run Itinerary - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/mirexdiydemo/viewItin.jsp?id=21

Modules:

Currently the parameter values shown below are "read" only. We plan, in future iterations, to allow users to modify specific parameters.

1. FanOut
2. Write ground-truth file list
   - delimiter: T
   - fileName: ground-truth
   - workingDir: /data/output/%ID%/
   - writeInputSignalsInFile: false
   - fileExt: .txt
   - omitClassName: false
3. ClassificationResultRead
   - numExamples: 0
   - verbose: true
4. Write test file list
   - delimiter: T
   - fileName: test
   - workingDir: /data/output/%ID%/
   - writeInputSignalsInFile: false
   - fileExt: .mf
   - omitClassName: true
5. Write training file list
   - delimiter: T
   - fileName: train
   - workingDir: /data/output/%ID%/
   - writeInputSignalsInFile: false
   - fileExt: .mf
   - omitClassName: false
6. Input Signal Arrays
   - propertiesFile: /data/resources/InputSi

Done

nema

View Job Status - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/mirexdiydemo/viewJob.jsp?id=424 Go

Job Status

Job ID	424
Name	DEMO - Marsyas Classification Experiment (128.174.154.136)
Status	Running
Start date	Sun Sep 02 13:37:33 CDT 2007
Finished date	
Machine	c0-1:7021
Your IP Address	128.174.154.136
Working Directory	/jobs/424
Console Output	

```
Overall Accuracy (normalised for class sizes) Marsyas audio genre example: 85.71% Standard
Deviation: 1.98
Raw Confusion Matrix:
Truth                  A        B        C
Classification
    A                    5        0        0
    B                    0        6        0
    C                    2        1        7

Confusion Matrix percentage:
Truth                  A        B        C
Classification
    A               71.43%    0.00%    0.00%
    B                0.00%   85.71%    0.00%
    C               28.57%   14.29%  100.00%
Matrix Key:
       A  : Classical
       B  : Electronic
       C  : Metal
--------------------------------------------------------------------------------

Extracting audio features from training file :  ./run4f90b651-113d2c51ea6--7f99/train2.mf
```

Done

ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN 1867
National Science Foundation WHERE DISCOVERIES BEGIN
THE ANDREW W. MELLON FOUNDATION
imirsel

Current and recent jobs - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/mirexdiydemo/listJobs.jsp

do it yourself mirex web service BETA

Home | View Job Queue | MIREX Wiki | MIREX 2005 Results Poster | MIREX 2006 Results Poster

Current and recent jobs

Job ID	Name	Status	Start date	Finished date	Runtime
424	DEMO - Marsyas Classification Experiment (128.174.154.136)	Completed	Sun Sep 02 13:37:33 CDT 2007	Sun Sep 02 13:38:32 CDT 2007	59 seconds
423	DEMO - Marsyas Classification Experiment (128.174.154.136)	Completed	Sun Sep 02 13:13:56 CDT 2007	Sun Sep 02 13:15:45 CDT 2007	108 seconds
422	DEMO - Matlab Key Finder (128.174.154.136)	Completed	Sun Sep 02 13:13:17 CDT 2007	Sun Sep 02 13:17:42 CDT 2007	265 seconds
421	DEMO - Marsyas Classification Experiment (130.126.146.63)	Completed	Fri Aug 31 09:15:15 CDT 2007	Fri Aug 31 09:16:14 CDT 2007	58 seconds
420	DEMO - Matlab Key Finder (130.126.146.63)	Completed	Fri Aug 31 08:58:04 CDT 2007	Fri Aug 31 09:01:55 CDT 2007	231 seconds

(Refresh page to update current job **Status** and **Runtime**.)

MIREX Project Leader : J. Stephen Downie (jdownie@uiuc.edu)
The International Music Information Retrieval Systems Evaluation Laboratory (IMIRSEL)

Dr. Downie and the IMIRSEL team are supported by the Andrew W. Mellon Foundation and the National Science Foundation (NSF) under Grant Nos. NSF IIS-0340597 and NSF IIS- 0327371.

Done

ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN · National Science Foundation WHERE DISCOVERIES BEGIN · THE ANDREW W. MELLON FOUNDATION · imirsel

DIY Key Finder - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/DIYKeyFinder/index.jsp

DIY key findr BETA

Home | View My Algorithms | View Job Queue | View Ranking

You are logged in as **jdownie**

Welcome to the MIREX DIY Key Finder Demonstration

Name: jdownie

Password: *********

Log in

MIREX Project Leader : J. Stephen Downie (jdownie@uiuc.edu)

The International Music Information Retrieval Systems Evaluation Laboratory (IMIRSEL)

Dr. Downie and the IMIRSEL team are supported by the Andrew W. Mellon Foundation and the National Science Foundation (NSF) under Grant Nos. NSF IIS-0340597 and NSF IIS- 0327371.

Done

DIY Key Finder - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/DIYKeyFinder/pickAlgo.jsp

DIY key findr BETA

Home | View My Algorithms | View Job Queue | View Ranking

You are logged in as **jdownie**

Welcome back **jdownie**.

You are currently signed up for the following tasks:

- Audio Key Finding

Here are the algorithms you have uploaded for the Audio Key Finding task:

- MATLAB Key Finder v1.0 (Run this Algorithm | View previous runs)
- Java Key Finder (Run this Algorithm | View previous runs)
- MATLAB Key Finder v0.1 (Run this Algorithm | View previous runs)

MIREX Project Leader : J. Stephen Downie (jdownie@uiuc.edu)
The International Music Information Retrieval Systems Evaluation Laboratory (IMIRSEL)

Dr. Downie and the IMIRSEL team are supported by the Andrew W. Mellon Foundation and the National Science Foundation (NSF) under Grant Nos. NSF IIS-0340597 and NSF IIS- 0327371.

Done

ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN | National Science Foundation WHERE DISCOVERIES BEGIN | THE ANDREW W. MELLON FOUNDATION | imirsel

DIY Key Finder - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/DIYKeyFinder/viewJob.jsp?id=430

You are logged in as **jdownie**

Job Status

Job ID	430
Name	DIY MATLAB Key Finder (MATLAB Key Finder v1.0)
Status	Running
Start date	Tue Sep 04 17:16:46 CDT 2007
Finished date	
Your IP Address	74.136.206.242
Working Directory	/jobs/430
Submit scores from this run	Submit Scores

Console Output

```
by Kris West, University of East Anglia, UK, kristopher.west@uea.ac.uk
        Running command: /usr/local/bin/matlab -nodisplay -nosplash -r
findAudioKey('./audiokey/twav/67.wav','./run4f90b651-113d2c51ea6--7f93/67.wav.output')
        in directory: ./run4f90b651-113d2c51ea6--7f93

Received detection file: ./audiokey/twav/05.wav
Received ground-truth: ./audiokey/twav/87.wav
Received ground-truth: ./audiokey/twav/73.wav
Received ground-truth: ./audiokey/twav/11.wav
Matlab Integration Module
by Kris West, University of East Anglia, UK, kristopher.west@uea.ac.uk
        Running command: /usr/local/bin/matlab -nodisplay -nosplash -r
findAudioKey('./audiokey/twav/95.wav','./run4f90b651-113d2c51ea6--7f93/95.wav.output')
        in directory: ./run4f90b651-113d2c51ea6--7f93

Received detection file: ./audiokey/twav/67.wav
Matlab Integration Module
by Kris West, University of East Anglia, UK, kristopher.west@uea.ac.uk
        Running command: /usr/local/bin/matlab -nodisplay -nosplash -r
findAudioKey('./audiokey/twav/29.wav','./run4f90b651-113d2c51ea6--7f93/29.wav.output')
        in directory: ./run4f90b651-113d2c51ea6--7f93
```

Done

nema

DIY Key Finder - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/DIYKeyFinder/viewJob.jsp?id=428

Job ID	428
Name	DIY MATLAB Key Finder (MATLAB Key Finder v1.0)
Status	Completed
Start date	Tue Sep 04 12:20:52 CDT 2007
Finished date	Tue Sep 04 12:26:21 CDT 2007
Your IP Address	74.136.206.242
Working Directory	/jobs/428
Submit scores from this run	Submit Scores

Console Output

```
        Perfect fifth error!File: ./audiokey/twav/01.wav
        Parallel major/minor error!File: ./audiokey/twav/19.wav
        Correct!File: ./audiokey/twav/17.wav
        Correct!File: ./audiokey/twav/57.wav
        Correct!File: ./audiokey/twav/11.wav
        Correct!File: ./audiokey/twav/45.wav
        Correct!File: ./audiokey/twav/27.wav
        Correct!File: ./audiokey/twav/75.wav
        Correct!File: ./audiokey/twav/51.wav
        Correct!File: ./audiokey/twav/81.wav
        Correct!File: ./audiokey/twav/89.wav
        Relative major/minor error!
------------------------------------------------------------------
Final Results:

Correct keys (1.0 point): 38
Perfect fifth errors (0.5 points): 5
Relative major/minor errors(0.3 points): 2
Parallel major/minor errors(0.2 points): 3
Errors(0.0 points): 0

Final Score: 41.7 out of a possible 48
Normalized Score: 0.869
```

Done

ILLINOIS UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN 1867

National Science Foundation WHERE DISCOVERIES BEGIN

THE ANDREW W. MELLON FOUNDATION

imirsel

nema

DIY Key Finder - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://cluster3.lis.uiuc.edu:8080/DIYKeyFinder/viewMatrix.jsp

DIY key findr BETA

Home | View My Algorithms | View Job Queue | View Ranking

You are logged in as **jdownie**

Ranking of algorithm results for Audio Key Finding

Job	Submitter	Algorithm	Correct keys	Errors	Final Score	Normalized Score	Parallel major/minor errors	Perfect fifth errors	Relative major/minor errors
145	cameron	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
277	jdownie	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
264	jdownie	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
228	jdownie	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
316	jdownie	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
158	jdownie	MATLAB Key Finder v1.0	38	0	41.7	0.869	3	5	2
159	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
278	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
154	cameron	Java Key Finder	35	4	39.1	0.815	0	7	2
155	cameron	Java Key Finder	35	4	39.1	0.815	0	7	2
263	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
245	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
156	cameron	Java Key Finder	35	4	39.1	0.815	0	7	2
179	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
164	jdownie	Java Key Finder	35	4	39.1	0.815	0	7	2
157	cameron	MATLAB Key Finder	20	14	26.3	0.548	1	11	2

Done

Something To Read!

- Downie, J. Stephen (2008). *The Music Information Retrieval Evaluation Exchange (2005-2007): A window into music information retrieval research*. Acoustical Science and Technology 29 (4): 247-255. Available at: http://dx.doi.org/10.1250/ast.29.247

Acknowledgements

- **Special Thanks to:**
  - ***The Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign***
  - ***The Andrew W. Mellon Foundation***
  - ***The National Science Foundation (Grant No. NSF IIS-0327371)***
  - ***Prof. Frank Tompa and all our University of Waterloo Colleagues!***