Music Information Retrieval

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MPATE-GE 2623 Music Information Retrieval
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- This course: http://www.nyu.edu/classes/bello/MIR.html
Music Information Retrieval

• Aims at extending the understanding and usefulness of music data, through the research, development and application of computational approaches and tools.

• Grounded in the combined use of theories, concepts and techniques from music, computer science, signal processing and cognition.

• Music information: bibliographical, surveys, tags, scores, MIDI, audio, etc.

• This course focuses on the analysis of audio signals (a very rich source of music information)

• Content or audio-based MIR? Music Signal Processing? Machine Listening?
For example ...

- **BPM histogram**
- **Tempogram**
- **Detection Function**
- **Spectrogram**
- **Audio Signal**

- Electronica
- Arousing
- Fast
- Folk
- David Gray
- Please Forgive me
- Singer-songwriter
- British

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MIR Industry (a few examples)

• Recommendation, Playlisting: Pandora, Spotify, YouTube Music, Amazon Prime Music, iHeart

• Audio Identification: Shazam, Gracenote

• Score Following: Rock Prodigy, SmartMusic, Rockband

• Others: Bose, LANDR, Smule, Native Instruments, ROLI, Steinberg

• For examples of a vibrant community: Monthly Music Hackaton

• Bridging industry and academia: Real Industry
MIR Research community

• Organized into the International Society for Music Information Retrieval and its conference (ISMIR)

• Last Conference: NYC, USA (https://wp.nyu.edu/ismir2016/)

• Next Conference: Suzhou, China, 10/23-27 2017

• Highly multidisciplinary: Library and Information Science, Computer Science, Music/Musicology, Electronic Engineering, Psychology, Law, etc.

• + Papers and sessions at ICASSP, NIPS, SMT, ICMC, SMC, DAFx, SIGIR
MIR Research community

- ISMIR home and mailing list: http://www.ismir.net/

- Cumulative list of all ISMIR papers: http://dblp.uni-trier.de/db/conf/ismir/index.html

- MIR-related PhD theses: http://www.pampalk.at/mir-phds/


- Million Song Dataset: http://labrosa.ee.columbia.edu/millionsong/
Calendar: Lectures

- **Weeks 1-2** Time-frequency representations
- **Weeks 3-4** Novelty: onset detection
- **Weeks 5-6** Low-level features: timbre analysis
- **Weeks 8-9** Periodicity: pitch and beat tracking
- **Weeks 10-11** Harmony: chord and key recognition
- **Weeks 12-13** Sound classification: genre and instrument ID
Assessment and Important dates

• Assignments (9.26, 10.17, 11.07, 11.21): 40% (4 x 10% each): announced in class/website, due a week after posting, penalties will apply to delays of up to 20 hours.

• Projects: 40% (groups of 2)
  • Proposal (11.28): 10%
  • Final project demo, report + presentation (12.19): 30%

• Mid-term Exam (10.31): 20% (best 2 out of 3 questions)

• Class Participation: extra (attendance, questions, discussions, interest)
Tutoring/Resources

• TA: Jon Forsyth (jpf211@nyu.edu), Thursdays 2-5pm, Room TBA

• USE THE OFFICE HOURS (Tuesdays 2-5pm)

• All relevant information is (or will be published) on the class website - Please read it carefully and keep checking for updates.

  • http://www.nyu.edu/classes/bello/MIR.html
Recommended Reading


• Lerch, A. “An Introduction to Audio Content Analysis”. John Wiley & Sons (2012)


• Further reading will be recommended as the course progresses.
To do

- INSTALL MATLAB ASAP!


- START LOOKING FOR GROUP AND PROJECT TOPIC: Visit MIR Community links, talk to current members of the MARL-MIR group (meets Tuesdays 10am), Attend the Thursday seminars.