Python in MIR

LibROSA + mir_eval
Python in MIR... why?

• Better coding practices, reproducible research

• Critical mass of...
  ○ existing modules and API support
  ○ developer ecosystem

• Integration with modern tools
  ○ numpy, scipy
  ○ IPython (+notebook)
  ○ scikit-learn
  ○ theano
Python in MIR... why not before?

- Entrenched legacy MATLAB code

- (previously) Lack of DSP/MIR tools in Python

- Wrappers exist (Marsyas, YAAFE, ...)
  - but these can be unwieldy, difficult to modify
LibROSA

https://github.com/bmcfee/librosa

- 100% Python
  - Minimal dependencies
  - Thoroughly documented
  - Strict unit tests on core functions
  - Easy to read and modify

- Easy to use

- Easy to install via PyPI:
  - $ pip install librosa
librosa 0.1.0 (June 2013, HAMR)

● Basic audio processing (IO, STFT)
● Feature extraction
● Rhythm analysis
● Harmonic-percussive source separation
librosa 0.2.0 (December 2013)

- **New modules:**
  - display: visualization
  - segment: structural segmentation
  - onset: onset detection

- **Additional features**
  - cqt, pseudo-cqt, utility functions, code refactoring...
  - examples and demo code
  - The list goes on, see [CHANGELOG](#)

- **Improved documentation**
librosa 0.2.1 (January 2014, NEMISIG)

- Efficiency improvements and bug fixes
- Parameter optimization
- Improved annotation export
- Improved evaluation interoperability
Open evaluation

- What if I want to run my own MIREX?
- MIR evaluations are notoriously difficult
- MIREX evaluation code is complex, huge dependency chain
mir_eval  https://github.com/craffel/mir_eval

● A python implementation of MIR evaluations
  ○ beat tracking  [Beat Evaluation Toolbox]
  ○ onset detection [Böck’s onset evaluator]
  ○ segmentation
  ○ chord recognition [Harte/McVicar]
  ○ blind source separation [BSS_Eval]

● And helpers...
  ○ data processing, alignment, chord reduction, ...
mir_eval v0.0.1 coming soon

- Pure python
- Fully documented
- Minimal dependency chain
- Easy to use
- Unit tests for numerical equivalence to MIREX
DEMO