

Multimedia Systems

1. Introduction to SMC

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FEUP

Sounds

Moodle

Download

Create account in Freesound.org

huge collaborative database of audio snippets, samples, recordings, bleeps, ... released under Creative Commons licenses that allow their reuse.

- Good platform to easily find sounds to analyse

Analysis of Sounds and Musical Elements

Sonic Visualiser

- *Open Software*
- *Load a sound (download from Moodle)*
- *See **waveform***
- *Obtain **spectrum***
- *Obtain **spectrogram***
- *Compute some **audio descriptors** (with MIR-EDU Vamp Plugin)*
- *Repeat for other sounds*

Goals

Get used to Sonic Visualiser GUI;

Create new panes to visualise:

- different sonic representations (e.g. waveform, spectrum, spectrogram),
- audio descriptors/low-level (e.g. spectral centroid, RMS);
- music representations/mid-high-level (“Tempo and Beat Tracker: Beats”, “MELODIA - Melody Extraction”)

Experiment with other files, always trying to visually confirm all the “information” your ears perceive!

You may also check [these Sonic Visualiser guides](#).

Analysis of Sounds and Musical Elements

FMP Notebooks

- *Run Python notebook*
- *Symbolic Format: MIDI (1.2.2)*
- *Frequencies and Pitches (1.3.2)*

Goals

Get conda environments ready;
Activate conda environment;
Be able to run some Python notebooks (remember to always select *.ipynb), while browsing the book or the HTML contents (in another browser);

Be able to change some code (for an easy example see the next page), run the cells again and listen the different sounds produced.

Browse through the contents of the Python notebooks and experiment!

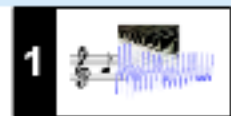
Analysis of Sounds and Musical Elements

FMP Notebooks Example

***/YourFMPFolder*/** is the location in your computer of the folder where you have the **FMP_0.1.1** folder.*

- In Terminal/Shell go to the **/YourFMPFolder*/** and activate your conda environment:
`conda activate FMP`
- In Terminal/Shell (same location) run the Jupiter notebook server:
`jupyter notebook`
- In the browser session (just opened) navigate (**through [ipynb] links**) to:

Music Representations

	Music Representations	Music notation, MIDI, audio signal, waveform, pitch, loudness, timbre	[html]	[ipynb]
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Musical Notes and Pitches

Musical Notes and Pitches	[Section 1.1.1] Note; pitch; pitch class; scale; enharmonic equivalence; twelve-tone equal-tempered scale; scientific pitch notation	[html]	[ipynb]
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- change the **duration** of the notes of the scale;
- change the **frequency** of some of the notes of the scale;
- Run the cells and listen to the result. Can you spot the difference? You're ready to roll!