Automatic Detection of Audio Problems for Quality Control in Digital Music Distribution

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For Digital Music Distributors, Audio Quality Control is paramount to guarantee the quality of their product. Given that manual QC is very time and resources consuming, automation is needed in order to develop an efficient and scalable service. This work is a collaboration between Essentia and SonoSuite in order to create and evaluate audio problem detection algorithms.

Essentia is an C++/Python library for audio signal processing, developed at the MTG-UPF and licensed under Affero GPL or commercial license.

Audio Problems

- Incorrect margins
- Insufficient silence
- Excessive silence
- Phase/Stereo problems
- False Stereo
- Phase problem
- Healthy
- Audio artifacts
- Burst
- Discontinuity
- Gap
- Click
- Loudness problems
- Insufficient
- Excessive
- Healthy
- True-Peak detection
- Clipping
- Excessive start silence
- Excessive end silence
- Insufficient start silence
- Insufficient end silence
- Large-scale deployment
- Real-time processing
- Cross-platform

Audio Problems

Incorrect margins
- Energy and time thresholds
- Phase/Stereo problems
- Pearson corr. coefficient
- Audio artifacts
- Gaps: audio envelope
- Clicks: LPC/matched filters
- Discontinuities: LPC
- Noise bursts: derivatives
- Clipping: threshold on the oversampled signal

Loudness & Saturation
- Loudness: measured following EBU-R128
- Saturation: energy and derivatives of the signal

Noises
- Humming tones: stability of the frequency bins in time
- SNR: Noise PSD estimated at the beginning of the song

Algorithms

Dataset
- 300k tracks from SonoSuite's collection
- Music from DMD all around the world

Method
- Problem detection rates

Conclusions
- We have developed and deployed a toolkit for audio problems detection
- These tools are been used in a real industrial scenario

Financed by: