Implementation of Harmonic-Percussive Sound Separation for Audacity

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### Project overview

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| Enable more people to use the Harmonic/Percussive Signal Separation (HPSS) sound effect | • Preprocessing for MIR-related tasks  
• New type of music equalization | Implement HPSS as a new effect for Audacity (a popular open source sound editor application) |

### Harmonic-percussive sound separation

- Separating the original power spectrogram into harmonic and percussive spectrograms by exploiting their anisotropies (horizontal = harmonic, vertical = percussive)
- Implementation based on sliding updates

![Harmonic and Percussive Components](image)

### Implementation in Audacity

**Harmonic-Percussive Sound Separation**
Separates a waveform into harmonic and percussive components

**HPSS-based vocal separation**
Applies HPSS twice with different frame sizes in the short-time Fourier transform (STFT) in order to obtain another decomposition for voice and other components

**Effect parameters**
- **Frame size** (acts as a “separation threshold”)
- **Mask type** (binary or Wiener; for time-frequency masking in STFT domain)
- **Output mode** (keep harmonic only, keep percussive only, or keep both)
- **Final amplification factor** (to avoid clipping)

### Effect parameters

![Effect Parameters](image)

### Current status and references

We implemented the effects as a patch for Audacity and sent it to the developers.


* work done while at the National Institute of Informatics