OnsetDetection

April 16, 2018

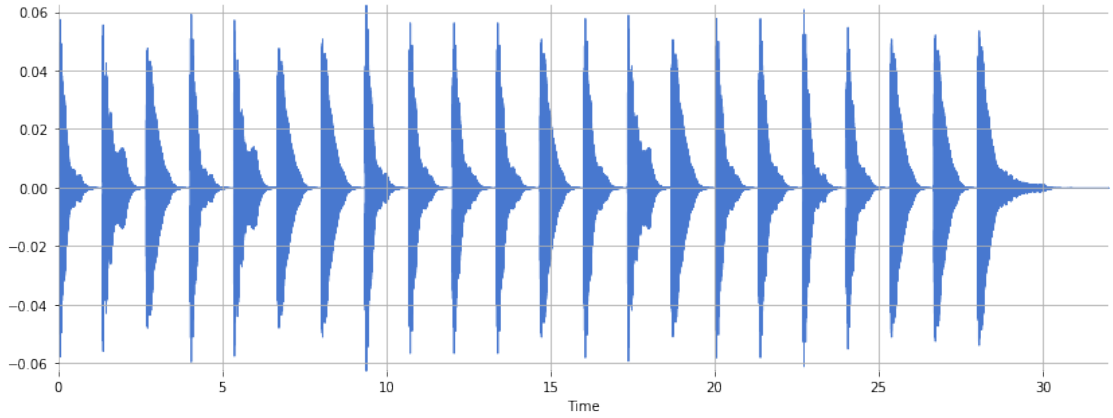
```
In [16]: %matplotlib inline
         import numpy, scipy, matplotlib.pyplot as plt, IPython.display as ipd
         import librosa, librosa.display
         import stanford_mir; stanford_mir.init()
```

```
In [25]: x, sr = librosa.load('/Users/nickpourazima/GitHub/he-sm/AudioFiles/staccato_44.1_16bi
         print(x.shape, sr)
```

```
(705600,) 22050
```

```
In [26]: plt.figure(figsize=(14, 5))
         librosa.display.waveplot(x, sr)
```

```
Out[26]: <matplotlib.collections.PolyCollection at 0x114eb3898>
```




```
In [27]: onset_frames = librosa.onset.onset_detect(x, sr=sr)
         print(onset_frames) # frame numbers of estimated onsets
```

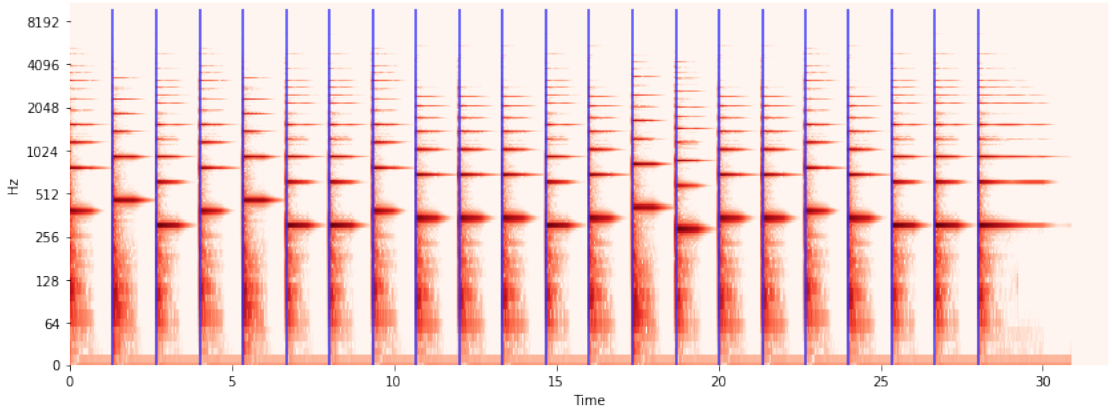
```
[  58  116  173  230  288  345  403  460  518  575  632  690  747  805
  862  920  977 1034 1092 1149 1207]
```

In [28]:
```
onset_times = librosa.frames_to_time(onset_frames)
print(onset_times)
```

```
[ 1.34675737  2.69351474  4.01705215  5.34058957  6.68734694  8.01088435
  9.35764172 10.68117914 12.02793651 13.35147392 14.67501134 16.02176871
 17.34530612 18.69206349 20.01560091 21.36235828 22.68589569 24.00943311
 25.35619048 26.67972789 28.02648526]
```

In [29]:
```
S = librosa.stft(x)
logS = librosa.amplitude_to_db(abs(S))
plt.figure(figsize=(14, 5))
librosa.display.specshow(logS, sr=sr, x_axis='time', y_axis='log', cmap='Reds')
plt.vlines(onset_times, 0, 10000, color='#3333FF')
```

Out[29]: <matplotlib.collections.LineCollection at 0x114e72e80>



In [30]:
```
plt.figure(figsize=(14, 5))
librosa.display.waveplot(x, sr=sr)
plt.vlines(onset_times, -0.8, 0.79, color='r', alpha=0.8)
```

Out[30]: <matplotlib.collections.LineCollection at 0x1140e7a58>