sked 24th Apr, 2015

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ct an optimal window for Short Time Fourier Transform ?
an optimal window for STFT for different audio signals. For a signal with
ents from 10 Hz to 300 Hz what will be the appropriate window size ? similarly
n frequency contents 2000 Hz to 20000 Hz, what will be the optimal window size

window size is 10 ms then this will give you a frequency resolution of about 100
equency contents in the signal lies from 100 Hz to 20000 HZ then 10 ms will be
ndow size ? or we should go for some other window size because of 20000 Hz
ent in a signal ?

sic "uncertainty principle" of the Fourier Transform. You can either have high
ne or high resolution in frequency but not both at the same time. The window
ou to trade off between the two.

m | Fourier Transform Infrared Spectroscopy | Audio Signal Processing | Audio Analysis

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13th Jan, 2017

oes not increase frequency resolution. Frequency resolution is approximately
here To is the time over which you collected the signal. To=NT, where N is the
ples and T is the sampling period. Zero opadding does produce an interpolat d
spectrum but it does not increase frequency resolution. Apart from that what
id is good and useful.

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5th May, 2015

letect 10 Hz in your audio signal, you need that at least one period of the
ts in the selected window, ie, 100msec. All the frequencies above 10Hz will be
hat window size. For a 2000Hz signal you will need a 0.5msec window.

is resolution you will need to increase number of points to compute the
T is a discrete representation, and the frequency bins are uniformly distributed in
of your signal and the distance between two adjacent frequency bins is Fs/N,
number of points in your FFT and Fs is the sampling frequency. Is Fs is fixed (as
ase the resolution you need more FFT points. With a fixed temporal window size
se the resolution by zero-padding the signal and the performing the FFT.

ommendations

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24th Apr, 2015

carrying information is in principle a non-stationary process. The concept of
uch a signal is only applicable for short time intervals, the so-called stationary

nmendations

Porteous

26th Apr, 2015

liscrete wavelet anlaysis' instead then it would select the most optimal window
and change the window length as you increased the frequency This will reduced
as you change the frequency.

nmendation

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ow the relationship between window length and frequency resolution and that
have high resolution in time or high resolution in frequency but not both at the
is is almost all you need to know. Now, to help you decide you also need to think
ole is the spectral content of the signal along time (the spectral 'sampling
u like). For audio signals window lengths of 5 ms to 20 ms are normally chosen,
s bang on the money and is a great start.

nmendations

ı Friend
ıiqal Systems

1st May, 2015

d C Heyser's papers at the Audio Engineering Society web site www.aes.org. He
ough a series of transforms that developed the Heyser Transform, of which an
ecial case. Kind of a 'General Theory of Relativity' for audio signals. Also see the