DESC9115 2012 LAB REPORT 2
Digital Audio System
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robot

For processing sound waves to add a robotic sound effects to an original sound wave.

Syntax

```
[sbu, sbl, robotsound] = robot( m, fs, fc)
```

Description

robot is a function used to alter an original sound by adding a robotic sounding effect. This function first applies the theorem of single sideband modulation to separate an original signal into two parts: the upper sideband signal, and the lower sideband signal. Adding the upper sideband signal and the lower sideband signal to the original signal creates the resulting signal which has a robotic sounding effect.

Input Signals

m	=	the original signal extracted from a sound file
fs	=	the frequency extracted from a sound file
fc	=	the carrier frequency chosen by the function users

Output Signals

sbu	=	the upper sideband signal
sbl	=	the lower sideband signal
robotsound	=	robotic output signal
robotsound.wav	=	resulting wave file

Note: The robotic sounding effect is more exaggerated as the carrier frequency increases. The pitch and the clipped sound of the resulting wave file also become more obvious as the carrier frequency increases.

Example

Create a robotic sound wave file from the resulting signals.

```
[m, fs] = wavread('dryspeech.wav');

fc = 1000;

[sbu, sbl, robotsound] = robot( m, fs, fc);
```
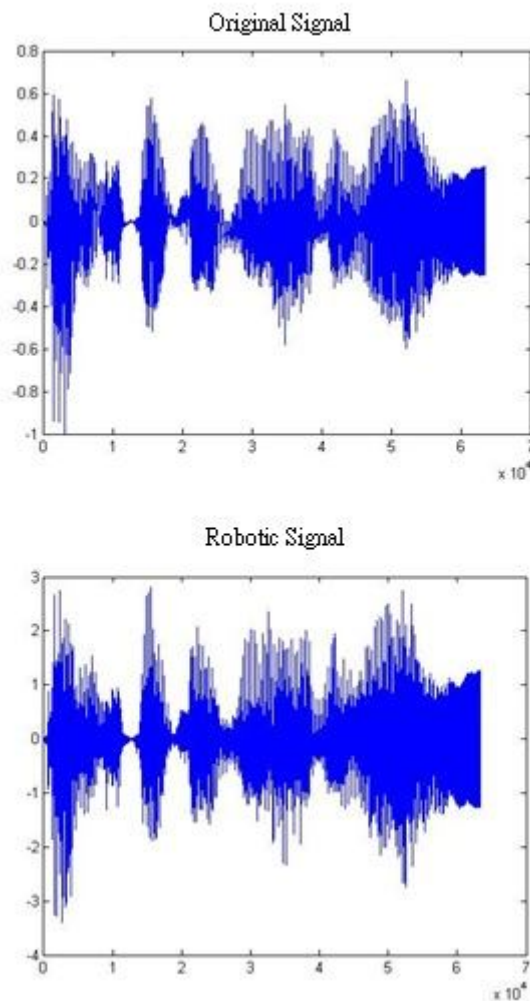

Figure 1 *The original signal and the processed signal of wave file dryspeech.wav*

Algorithms

This function uses an amplitude algorithm from S. R. Tuladhar. [1]

`cos`, `Hilbert`, `wavwrite`, `max`, and `size` functions are also applied in robot.

References

[1] S. R. Tuladhar, "Matlab Central," *Amplitude Modulation.*14th October 2005.