DT Sinc Function (1B)

- Discrete Time Sinc Function

Young Won Lim
9/26/13

Please send corrections (or suggestions) to youngwlim@hotmail.com.

This document was produced by using OpenOffice and Octave.

DT Sinc Function

DT Signal Aliasing - COS

CT Sinc Function (1)

Normalized Sinc function

$$sinc(t) = \frac{\sin(\pi t)}{\pi t}$$

$$sinc(-t) = \sin\frac{(-\pi t)}{-\pi t} = sinc(t)$$

an even function

$$\lim_{t \to 0} \frac{\sin(\pi t)}{\pi t} = 1$$

Maximum: $sinc(0) = 1 \quad when\ t = 0$

$t = n$ n: integer $(n \neq 0)$

Zeros: $sinc(t) = \frac{\sin(n\pi)}{n\pi} = 0$

Unnormalized Sinc function

$$sinc(x) = \frac{\sin(x)}{x}$$

$$sinc(-x) = \sin\frac{(-x)}{-x} = sinc(x)$$

an even function

$$\lim_{t \to 0} \frac{\sin(x)}{x} = 1$$

Maximum: $sinc(0) = 1 \quad when\ x = 0$

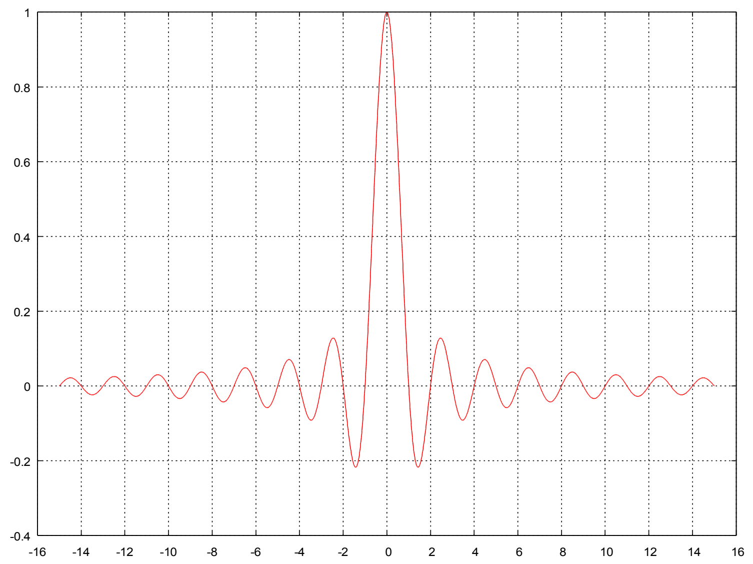
$x = \pi n$ n: integer $(n \neq 0)$

Zeros: $sinc(x) = \frac{\sin(x)}{x} = 0$

Sinc Function (2)

Normalized Sinc function

$$sinc(t) = \frac{\sin(\pi t)}{\pi t}$$



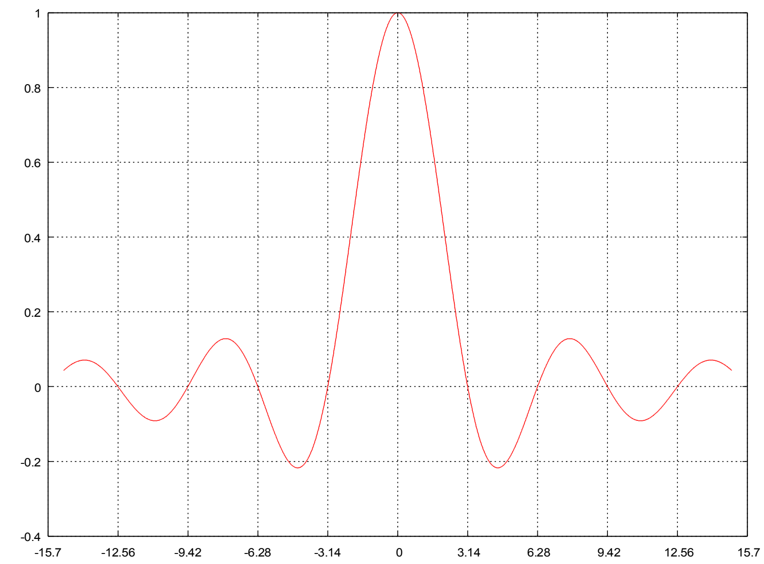
Zeros at $t = n$ n: integer $(n \neq 0)$

Normalized Sinc function

Octave sinc(x) = sin(pi*x)/(pi*x)

Unnormalized Sinc function

$$sinc(x) = \frac{\sin(x)}{x}$$



Zeros at $x = \pi n$ n: integer $(n \neq 0)$

Unnormalized Sinc function

Young Won Lim
9/26/13

References

[1] http://en.wikipedia.org/
[2] J.H. McClellan, et al., Signal Processing First, Pearson Prentice Hall, 2003
[3] G. Beale, http://teal.gmu.edu/~gbeale/ece_220/fourier_series_02.html
[4] C. Langton, http://www.complextoreal.com/chapters/fft1.pdf