

Pros:

preserve edge

Cons:

High cost(time complexity)

gradient reversal

staircase effect(cartoonize)

Appropriate use

Denoising: denoising while preserving edge

Contrast management: detail enhancement or reduction by separating image into large scale component and small scale component

Depth reconstruction: can be done by using the fact that the distance between two points(disparity) is inversely proportional to the depth of the pixel

Data fusion: combine no flash image and flash image into low light image

3D fairing: smooth mesh surface

출처:

[1] https://en.wikipedia.org/wiki/Bilateral_filter

[2] Sylvain Paris; Pierre Kornprobst; Jack Tumblin; Frédo Durand, "Bilateral Filtering: Theory and Applications," in Bilateral Filtering: Theory and Applications , now, 2009.

By using

$$\int_{-\infty}^{\infty} f(t)e^{-i\omega t} dt = F(\omega)$$

Show that

$$\int_{-\infty}^{\infty} f(t - T)e^{-i\omega t} dt = e^{-i\omega T} F(\omega)$$

LHS

Replace $t - T$ with x

$$\int_{-\infty}^{\infty} f(t - T)e^{-i\omega t} dt = \int_{-\infty}^{\infty} f(x)e^{-i\omega(x+T)} dx = e^{-i\omega T} \int_{-\infty}^{\infty} f(x)e^{-i\omega x} dx = e^{-i\omega T} F(\omega)$$