## TFW HWZ P10942A05 鄭寶軟

We choose larger of due to the scaled Gabor transform is more sensitive in time domain, and person don't need too high resolution in frequency domain

Z'(a) If 
$$\chi(t) = \exp(-\pi t^2)$$

$$W_{\chi}(t,f) = \int_{-\infty}^{\infty} \chi(t+\frac{\pi}{2}) \chi'(t-\frac{\pi}{2}) e^{-j2\pi ft} dt$$

$$= \int_{-\infty}^{\infty} e^{-\pi (t+\frac{\pi}{2})^2} e^{-\pi (t-\frac{\pi}{2})^2} e^{-j2\pi ft} dt$$

$$= e^{-2\pi f^2} \int_{-\infty}^{\infty} e^{-\pi (t-\frac{\pi}{2})^2} e^{-j2\pi ft} dt$$

$$= e^{-2\pi f^2} \int_{-\infty}^{\infty} e^{-\pi (t-\frac{\pi}{2})^2} e^{-j2\pi ft} dt$$

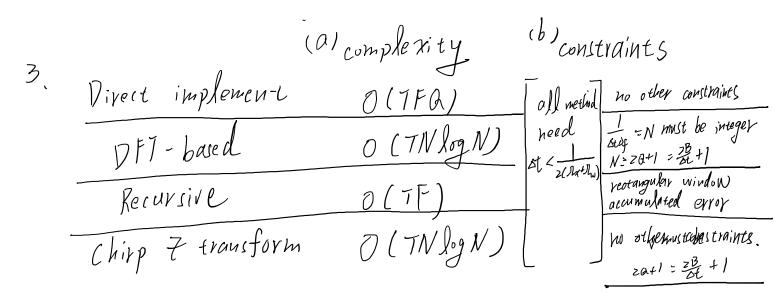
(b) If x(t) = S(zt-1)

$$W_{r}(t,f) = \int_{-\infty}^{\infty} \chi(t+\frac{1}{2}) \chi^{*}(t-\frac{1}{2}) e^{-ij\pi ft} dt$$

$$= \int_{-\infty}^{\infty} S(7t+t-1) S(2t-t-1) e^{-ij\pi ft} dt$$

$$= \int_{-\infty}^{\infty} S(7t+t-1) e^{-ij\pi ft} dt$$

$$= \int$$



(C) Direct implement

DFT-based

Chirp Z transform

(a) windowed WDF cross term appear between  $t_1, t_2$ when viewing case  $\chi(t) = S(t-t_1)^+ S(t-t_2)$ so If we implement windows furtion, we can reduce select cross term area, then avoid cross term.

In Cohem's class distribution, the center of auto term will be (0,0), when  $[t_2-t_1]$ ,  $[t_2-t_1]$  are large, we can use low pass mask to avoid cross term

(C) First we use Gabor transform will not have cross term problem, second we multiply WDF the cross term area will multiply zero to avoid cross term.

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In Fourier transform

If  $\chi(\tau) \hookrightarrow F(f)$   $\chi^*(\tau) \hookrightarrow F^*(f)$ when  $F(f) = F^*(f)$  means F(f) is real

In Cohen's class distribution

 $A_{x}(\tau,\eta) \not\equiv (\tau,\eta) = A_{x}^{*}(-\tau,-\eta) \not\not\equiv \xi^{*}(-\tau,-\eta)$  when fulfill  $\not\equiv (\tau,\eta) = \not\equiv \xi^{*}(\tau,-\eta)$  will alway be real.

上課問答

WDF在除了二個以上物件及order超過二次時會事致 cross term problem

