

维纳滤波实践

主讲人：码大虾

维纳滤波降噪

- 频域维纳滤波解(增益函数):

$$H(\omega_k) = \frac{P_{xx}(\omega_k)}{P_{xx}(\omega_k) + P_{nn}(\omega_k)}$$

- 定义先验信噪比:

$$\xi_k \triangleq \frac{P_{xx}(\omega_k)}{P_{nn}(\omega_k)} \quad \gamma_k = \frac{P_{yy}(w_k)}{P_{nn}(w_k)}$$

- 将先验信噪比代入 $H(w_k)$ 有:

$$H(\omega_k) = \frac{\xi_k}{\xi_k + 1}$$

维纳滤波变体

$$H(\omega_k) = \left(\frac{P_{xx}(\omega_k)}{P_{xx}(\omega_k) + aP_{nn}(\omega_k)} \right)^\beta$$

$$\begin{aligned} g(k) &= \frac{P_{xx}(\omega_k)}{P_{xx}(\omega_k) + \mu_k P_{dd}(\omega_k)} \\ &= \frac{\xi_k}{\xi_k + \mu_k} \end{aligned}$$