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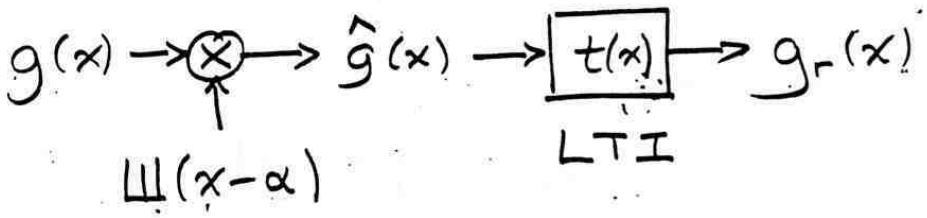
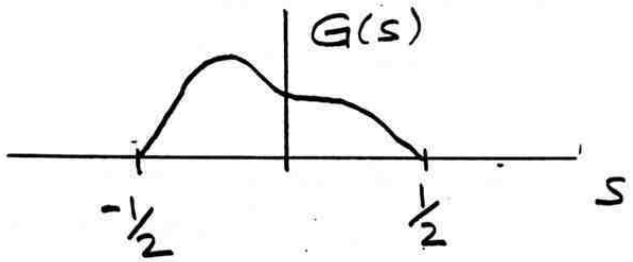
System

The Effect of Shifting the Sampling Function

- $g(x)$ is sampled to produce $\hat{g}(x)$.
- The LTI system has impulse response $t(x) = \text{sinc}(x)$ (unless noted) and produces the recovered signal $g_r(x)$.
- The sampling function is shifted by α.



For problem 1, let $\mathcal{F}\{g(x)\} = G(s)$ as shown below.



1. Let the measure of error between $g_r(x)$ and $g(x)$ be

$$\epsilon = \int_{x=-\infty}^{\infty} |g_r(x) - g(x)|^2 \, dx \, .$$

   (a) Will this error depend on the shift α?

   (b) Repeat part (a) but let $t(x) = \Lambda(x)$.