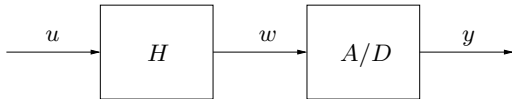


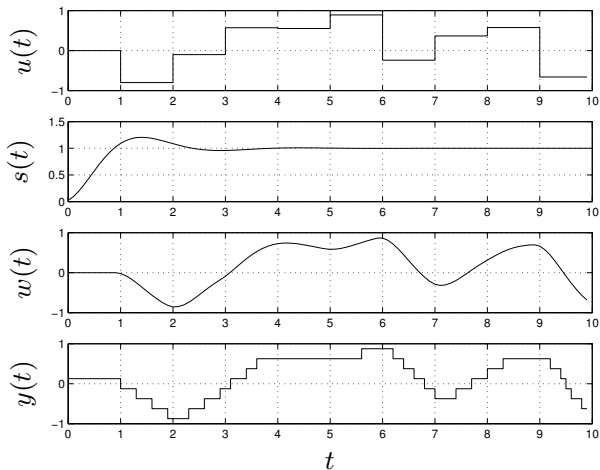
Example: Estimation / Filtering

Estimation / filtering



- ▶ signal u is piecewise constant (period 1 sec)
- ▶ filtered by 2nd-order system H , step response $s(t)$
- ▶ A/D runs at 10Hz, with 3-bit quantizer

Typical behavior



problem: estimate original signal u , given quantized, filtered signal y

Simple approach

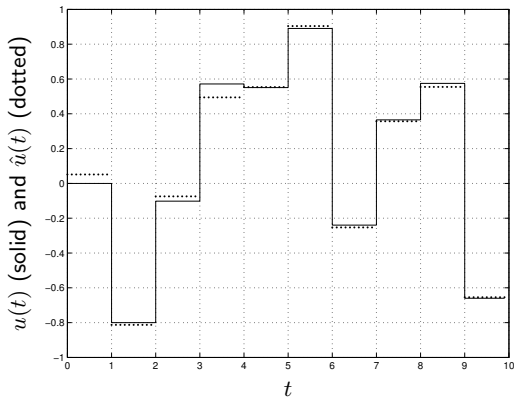
one simple approach:

- ▶ ignore quantization
- ▶ design equalizer G for H (i.e., $GH \approx 1$)
- ▶ approximate u as Gy

... yields terrible results

Better approach

formulate as *estimation problem* (EE263) ...



RMS error 0.03, well *below* quantization error (!)