EECE 5612 HW6
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$$\hat{\tau}_{ml} = argmin_{\tau} \int_{T_{obs}} r(t)s(t-\tau)dt = argmax_{\tau} R_{rs}(\tau)$$

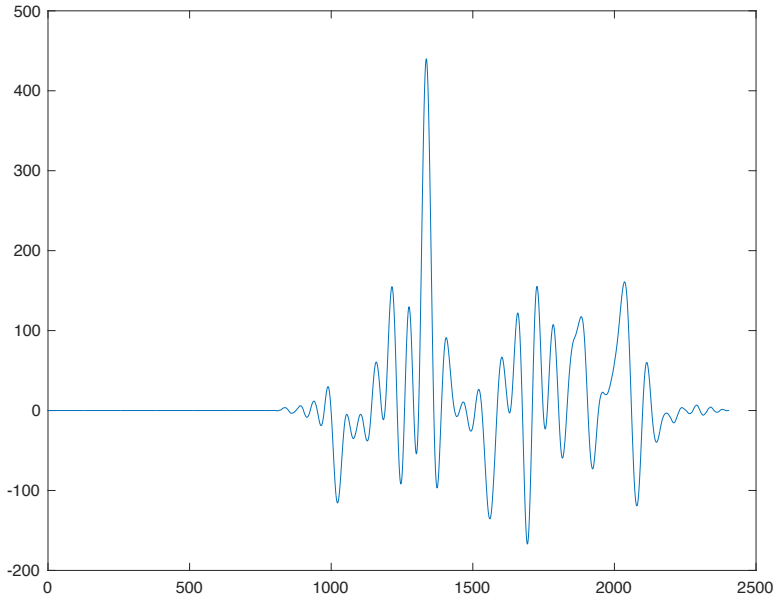
To find the estimation of the time delay, the value for *t* was found that maximized the cross correlation between the known signal waveform and the observed signal + noise

```
y = load("hwk6.mat");
g_t = y.g;
v_t = y.v;

R_vg = xcorr(v_t, g_t);
[maxVal, tau] = max(R_vg);

plot(R_vg);
disp(tau / 40);
disp(maxVal);
```

Figure 1. Cross Correlation of g(t) and v(t)



Max value is 439.95 and occurs at t = $1136\ rev * \frac{1\ sec}{50\ rev} = 26.72\ sec$