Notes on the simulink library adaptlib

Introduction These notes are meant to provide intial help on using the blocks in adaptlib. So far, only the ones needed to complete Homework 2 in FRTN15 are described. Note that this is not a user's guide or a manual but a brief description of what the parameters in the blocks mean.

In-direct RLS-Estimator m is the number of elements in the $B(q)$-matrix while n is the number of unknown elements in the $A(q)$-matrix. For the system

$$H(q) = \frac{b_1 q + b_2}{q^2 + a_1 q + a_2 q}$$

we have $m = 2$ and $n = 2$. It is assumed that $A(q)$ is monic. The initial estimate is a vector of size $(n+m)\times 1$ with inital estimates for the parameters, $(\hat{b}_1\ \hat{b}_2\ \hat{a_1}\ \hat{a_2})^T$ for the example above. The initial covariance matrix should be square of size $m + n$. The remaining parameters are the forgetting factor λ and the sampling period.

Minimum-degree pole-placement design without zero cancelation The first three parameters specify the degree of the $A(q)$, $B(q)$, and $R(q)$ polynomials. The parameter A_o should contain the observer polynomial in standard simulink-format, the same goes for A_m. If you want to specify known factors in $R(q)$ or $S(q)$ (for instance when introducing integral action) they are entered in the next two fields.

Adaptive 2DOF controller The first entry is the degree of the polynomials (scalar entry). The second is the intial state of the polynomial coefficients.