

ID9

ARAR(X)

Identification



9.2 OPTIMAL ARARX PREDICTORS

Relation (9.1.4) shows that ARARX models admit the equivalent ARX form

$$s(z^{-1}) q(z^{-1}) y(t) = s(z^{-1}) p(z^{-1}) u(t) + w(t); \quad (9.2.1)$$

the optimal one-step-ahead predictor is thus given by

$$y(t|t-1) = (1 - s(z^{-1}) q(z^{-1})) y(t) + s(z^{-1}) p(z^{-1}) u(t). \quad (9.2.2)$$

Using a forward notation, the optimal predictor can be written as

$$y(t + n^*|t + n^* - 1) = (z^{n^*} - s(z) q(z)) y(t) + s(z) p(z) u(t). \quad (9.2.3)$$

This predictor, as all ARX predictors, is free from stability constraints.

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