

ID3

ARX Identification



3.9 DISTRIBUTION OF ESTIMATION ERRORS



A further element useful in evaluating the estimates obtained with least squares concerns the associated probability distribution; it is possible to prove that the distribution of the random variable

$$\sqrt{N} (\theta^\circ - \theta^*) \quad (3.9.1)$$

will converge, for $N \rightarrow \infty$, to a Gaussian distribution with null mean value and covariance matrix given by

$$\sigma_e^2 R^{*-1} \quad (3.9.2)$$

where

$$R^* = \lim_{N \rightarrow \infty} \left[\frac{H^T H}{N} \right]; \quad (3.9.3)$$

the convergence of $(H^T H / N)$ is assured (with probability 1) when the input is a quasi-stationary process.

[SECTIONS](#)
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[FAQ](#)
[TUTOR](#)
[NEXT MODULE](#)