

ID4

AR Identification



4.7 MODEL ORDER ESTIMATION



PPCRE, FPE, AIC and MDL criteria that have been described for ARX models, can be used also for AR models without introducing any variation because the cost function that has been considered is the same. A further criterion, that can be deduced from Levinson algorithm, consists in analyzing the partial correlation (or reflection) coefficients given, in an order k model, by α_1^k (using the same notation introduced to develop the Levinson algorithm). For an AR process with order n $\alpha_1^k = 0$ for $k > n$; the stability of the model also requires that $|\alpha_1^k| < 1$. Applying Levinson algorithm for $k = 1, 2, \dots$ it is possible to obtain the series of partial correlation coefficients

$$\alpha_1^1, \alpha_1^2, \dots, \alpha_1^k, \dots \quad (4.7.1)$$

that can be evaluated for increasing values of k . If these coefficients do not annihilate for high values of k , an AR model could be unsuitable to interpret the data. This test is usually performed plotting the partial correlation coefficients or, to obtain a more readable indication, plotting their absolute values.

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