ID6
ARMAX Identification

QUESTIONS

Q.6.1 – Describe the difference between ARX and ARMAX models.

Q.6.2 – Describe a possible drawback of optimal ARMAX predictors.

Q.6.3 – Is Instrumental Variable a specific algorithm or a family of algorithms? Explain your reply.

Q.6.4 – Which requirements must be satisfied by instruments?

Q.6.5 – Are instrumental variable methods based on the minimization of any cost function or on other considerations?

Q.6.6 – Describe two alternative ways to obtain instruments for ARMAX identification.

Q.6.7 – Describe the steps of a possible procedure based on IV methods to estimate the parameters of an ARMAX process and its possible drawbacks.

Q.6.8 – Which differences characterize extended IV methods with respect to IV ones?

Q.6.9 – Can IV algorithms be applied also to time–dependent processes?

Q.6.10 – Describe the relation between Maximum Likelihood and PEM methods in the estimation of the parameters of ARMAX processes when the remote white noise $w(t)$ is Gaussian.

Q.6.11 – Can PEM estimates for ARMAX processes be expressed in a closed form?

Q.6.12 – Which algorithms can be applied to compute PEM estimates for ARMAX processes?

Q.6.13 – Which countermeasures can be taken when the Gauss–Newton algorithm leads to intermediate ARMAX models characterized by unstable optimal predictors?

Q.6.14 – Compare advantages and disadvantages of IV and PEM in identifying ARMAX models.

Q.6.15 – Describe possible identifiability problems in multivariable ARMAX identification.

Q.6.16 – Describe how minimally parametrized optimal ARMAX predictors can be deduced for multivariable ARMAX models.

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