ID5
MA Identification

5.1 MA MODELS

MA (Moving Average) models describe processes whose output is a moving average of samples of a white process. In the scalar case these models are described by relation

$$y(t) = w(t) + \gamma_n w(t-1) + \ldots + \gamma_1 w(t-n) \tag{5.1.1}$$

where $w(\cdot)$ denotes a stochastic white process with null expected value, $\mathrm{E}[w(t)] = 0$, and n is the order of the process. Introducing the polynomial in z^{-1}

$$r(z^{-1}) = 1 + \gamma_n z^{-1} + \ldots + \gamma_1 z^{-n}, \tag{5.1.2}$$

model (5.1.1) can be written in the compact form

$$y(t) = r(z^{-1})\, w(t). \tag{5.1.3}$$

Making reference to forward notations, (5.1.1), (5.1.2) and (5.1.3) become

$$y(t+n) = w(t+n) + \gamma_n w(t+n-1) + \ldots + \gamma_1 w(t) \tag{5.1.4}$$

$$r(z) = z^n + \gamma_n z^{n-1} + \ldots + \gamma_1 \tag{5.1.5}$$

$$z^n\, y(t) = r(z)\, w(t). \tag{5.1.6}$$

Model (5.1.6) can be written in the form

$$y(t) = \frac{r(z)}{z^n}\, w(t) = F(z)\, w(t) \tag{5.1.7}$$

which evidentiates how MA processes, like AR ones, can be considered as generated by a filter driven by a remote white process (Figure 5.1.1).

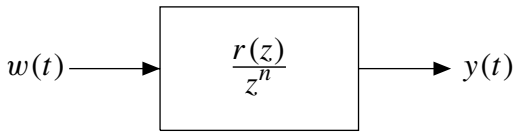

Figure 5.1.1 - Structure of a MA process

SECTIONS MODULES QUESTIONS HOME PAGE
PREV. MODULE FAQ TUTOR NEXT MODULE