

**HOMEWORK ASSIGNMENT TREE - Correction**

PREVIOUSLY

3. [1 point] **KALMAN FILTER**

Write the following bilinear model in a state space form:

$$y_t = \phi y_{t-1} + \theta \epsilon_{t-1} + \beta \epsilon_{t-1} + \epsilon_t, \quad t = 1, \dots, T., \quad (1)$$

where  $\epsilon_t \sim \text{i.i.d. } N(0, \sigma^2)$  and  $\phi, \theta$ , and  $\beta$  are unknown parameters.

NOW

3. [1 point] **KALMAN FILTER**

Write the following bilinear model in a state space form:

$$y_t = \phi y_{t-1} + \theta \epsilon_{t-1} + \beta \epsilon_{t-1} y_{t-1} + \epsilon_t, \quad t = 1, \dots, T., \quad (2)$$

where  $\epsilon_t \sim \text{i.i.d. } N(0, \sigma^2)$  and  $\phi, \theta$ , and  $\beta$  are unknown parameters.