simStateSpace: Staging

Ivan Jacob Agaloos Pesigan

Convert OU to SSM.

$$\boldsymbol{\beta} = \exp\left(-\boldsymbol{\Phi}\Delta_t\right) \tag{1}$$

$$\boldsymbol{\alpha} = -\boldsymbol{\Phi}^{-1}\left(\boldsymbol{\beta} - \boldsymbol{I}_p\right) \tag{2}$$

$$\text{vec}\left(\boldsymbol{\Psi}\right) = \left\{\left[\left(-\boldsymbol{\Phi} \otimes \boldsymbol{I}_p\right) + \left(\boldsymbol{I}_p \otimes -\boldsymbol{\Phi}\right)\right]\left[\exp\left(\left[\left(-\boldsymbol{\Phi} \otimes \boldsymbol{I}_p\right) + \left(\boldsymbol{I}_p \otimes -\boldsymbol{\Phi}\right)\right]\Delta_t\right) - \boldsymbol{I}_{p\times p}\right]\text{vec}\left(\boldsymbol{\Sigma}\right)\right\} \tag{3}$$

References

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/