$$Y^{ ext{ctrl}} = X^{ ext{ctrl}} \left(U^{ ext{ctrl}}
ight)^{\mathsf{T}} \;\;,\;\; x^{ ext{ctrl}}_{ij} \sim \mathcal{N}(0,1)$$
 $Y^{ ext{case}} = X^{ ext{case}} \left(U^{ ext{case}}
ight)^{\mathsf{T}} \;\;,\;\; x^{ ext{case}}_{ij} \sim \mathcal{N}(0,1)$ $\left[Y^{ ext{ctrl}}
ight]$