$$\phi^x \left(\begin{bmatrix} \boldsymbol{x}_t \\ \boldsymbol{u}_t \end{bmatrix} \right) = \begin{bmatrix} \boldsymbol{x}_t \\ \boldsymbol{u}_t \otimes \boldsymbol{x}_t \\ \boldsymbol{u}_t \end{bmatrix}$$