$$\mathcal{T}\mathcal{M}_{\mathcal{E}}$$

$$\mathcal{X}(t)$$

$$\mathcal{X}^{\mathcal{T}}\mathcal{M}_{\mathcal{X}}$$

$$\dot{\mathcal{X}} = \mathcal{X}^{-1}\dot{\mathcal{X}}$$

$$\dot{\mathcal{X}} = \frac{\partial \mathcal{X}(t)}{\partial t}$$