

$$\mathbb{F} \left[\underset{\substack{\uparrow \\ \text{non vector}}}{g^i(t)} \quad \underset{\substack{\uparrow \\ \text{matrix}}}{\nabla g(t)} \right] g_j \quad (\nabla g) =$$

$$\text{ie } = \mathbb{E} \left[\sum g_i \frac{\partial g_i}{\partial g_j} \right] = 0 \quad ?$$

$$(\nabla g)_i = \frac{\partial g}{\partial x_i} = \frac{\partial g}{\partial x_i}$$

Yes holds!

$$\left[\frac{\partial g}{\partial \theta} \right]$$

$$\left(\begin{array}{c} 1 \\ 0 \\ 0 \end{array} \right)$$

$$(((($$

$$\nabla g: \mathbb{R}^n \rightarrow \mathbb{R}^n.$$

$$g^T(s) = g^T(t) + \nabla g^T(t) (t-s) + \frac{1}{2} (t-s)^T \nabla^2 g^T(t) (t-s)$$

$$g \left(\begin{pmatrix} & \\ & \end{pmatrix} \right) \left(\begin{pmatrix} g & (t-s)^{\frac{1}{2}} \\ & \nabla g \end{pmatrix} \right)$$

$$= \sum g_i (t_j - s_i) \quad \nabla^2 g$$

$$= \sum_k (g(t-s))_{ik} \nabla g_{kj}$$

$$= \sum_n g_i(t-s)_k \cdot \nabla g_{nj}$$

$$= \sum_n (t_n - t_n) \frac{\partial g}{\partial g_i} \frac{\partial g_i}{\partial g_j}$$