Top-level UDE

$$\frac{\partial r}{\partial u} \frac{\mathrm{d}u}{\mathrm{d}r} = I = \frac{\partial r}{\partial u}^T \frac{\mathrm{d}u}{\mathrm{d}r}^T$$

Sub-level total derivatives
= top-level partial derivatives

$$I = \frac{\partial r}{\partial u}^T \frac{\mathrm{d}u}{\mathrm{d}r}^T$$

Sub-level UDE