

$$\begin{aligned}\vec{z}^T \vec{z} &= (z_1 \dots z_d) \begin{pmatrix} z_1 \\ \vdots \\ z_d \end{pmatrix} \\ &= z_1^2 + \dots + z_d^2\end{aligned}$$

$$\vec{y} = \vec{\mu} + B \vec{x}$$

$$\vec{x} = B^{-1} (\vec{y} - \vec{\mu})$$

$$h(\vec{x}) = B^{-1} (\vec{y} - \vec{\mu})$$

$$\nabla h(\vec{x}) = B^{-1}$$

$$h_i(x) = \sum_j (\beta^{-1})_{ij} (y_j - \mu_j)$$

$$\frac{\partial h_i(x)}{\partial y_k} = (\beta^{-1})_{ik}$$