$\Sigma_{A,B} =$

$$\begin{pmatrix} f \\ \nabla^2 f \end{pmatrix} \Big| \nabla f = 0 \sim N($$

$\Sigma_{A,B}$ $I \times N$

$$A \begin{pmatrix} f \\ B\nabla f \\ \nabla^2 f \end{pmatrix} \sim N\left(0, \begin{pmatrix} \cancel{\sigma^2} 1 & 0 & -\Lambda(t) \\ 0 & \Lambda(t) & A(t) \\ -\Lambda(t) & A^T(t) & B(t) \end{pmatrix}\right)$$

Σ

$N(N+1/2) \times N$

$$\Rightarrow \begin{pmatrix} f \\ \nabla^2 f \end{pmatrix} \Big| \nabla f \sim \text{Normal}.$$

$$\Sigma_{A,B} = \begin{pmatrix} 0 \\ A^T(t) \end{pmatrix}$$

$$\Sigma_{A,A} = \begin{pmatrix} 1 & -\Lambda \\ \Lambda & B(t) \end{pmatrix}$$

$$\Sigma_{B,B} = \Lambda(t)$$

$$\underline{\text{mean}} = \underbrace{\begin{pmatrix} 0 \\ A^T(t) \end{pmatrix}}_{N(N+1/2) \times N} \overbrace{\Lambda^{-1}(t)}^{N \times N} \nabla f = 0$$

$I \times N$

Σ

$$\text{var} = \begin{pmatrix} 1 & -\Lambda \\ -\Lambda & B(t) \end{pmatrix} - \underbrace{\begin{pmatrix} 0 \\ A^T(t) \end{pmatrix} \Lambda^{-1}(t) \begin{pmatrix} 0 & A(t) \end{pmatrix}}$$

$$= \begin{pmatrix} 0 \\ A^T(t) \end{pmatrix} \begin{pmatrix} 0 & \Lambda^{-1}(t) A(t) \end{pmatrix}$$

$$= \begin{pmatrix} 0 & 0 \\ 0 & A^T(t) \Lambda^{-1}(t) A(t) \end{pmatrix}$$