

$$(x_1,x_2,\dots,x_N)\sim GP(m,C)$$

$$C=\begin{bmatrix} C(x_1,x_1) & C(x_1,x_2) & \dots & C(x_1,x_N) \\ C(x_2,x_1) & C(x_2,x_2) & \dots & C(x_2,x_N) \\ & & \ddots & \\ C(x_N,x_1) & C(x_N,x_2) & \dots & C(x_N,x_N) \end{bmatrix}$$

$$(x_1,x_2,\dots,x_N,x^*)\sim \mathcal{N}\left(\begin{bmatrix} m(\mathbf{x}) \\ m(x^*) \end{bmatrix},\begin{bmatrix} C^{**} & C^{*\top} \\ C^* & C \end{bmatrix}\right)$$

$$C^*=\begin{pmatrix} C(x_1,x^*) & C(x_2,x^*) & \dots & C(x_N,x^*) \end{pmatrix}^\top, \; C^{**}=C(x^*,x^*)$$

$$X\sim \mathcal{N}(\mu,\Sigma)$$

$$\mu_{\text{||}2}=\mu_1+\Sigma_{12}\Sigma_{22}^{-1}\left(y_2-\mu_2\right),\;\Sigma_{\text{||}2}=\Sigma_{11}-\Sigma_{12}\Sigma_{22}^{-1}\Sigma_{21}$$

$$x^*\mid(x_1,x_2,\dots,x_N)\sim \mathcal{N}\Big(m(x^*)+C^{*\top}C^{-1}\Big(x^*-m(x^*)\Big),C^{**}-C^{*\top}C^{-1}C^*\Big)$$