University of California, Los Angeles
Department of Statistics

Statistics C173/C273 **Instructor: Nicolas Christou**

Ordinary kriging in matrix and vector form

Using covariance
Vector of the weights:

$$\mathbf{w} = \mathbf{C}^{-1}\left[\mathbf{c} + \frac{1 - \mathbf{1}'\mathbf{C}^{-1}\mathbf{c}}{\mathbf{1}'\mathbf{C}^{-1}\mathbf{1}}\mathbf{1}\right]$$

Lagrange multiplier:

$$\lambda = \frac{1 - \mathbf{1}'\mathbf{C}^{-1}\mathbf{c}}{\mathbf{1}'\mathbf{C}^{-1}\mathbf{1}}$$

Kriging variance:

$$\sigma^2_{OK} = C(0) - \mathbf{w}'\mathbf{c} + \lambda$$

Using variogram
Vector of the weights:

$$\mathbf{w} = \mathbf{\Gamma}^{-1}\left[\boldsymbol{\gamma} - \frac{\mathbf{1}'\mathbf{\Gamma}^{-1}\boldsymbol{\gamma} - 1}{\mathbf{1}'\mathbf{\Gamma}^{-1}\mathbf{1}}\mathbf{1}\right]$$

Lagrange multiplier:

$$\lambda = \frac{\mathbf{1}'\mathbf{\Gamma}^{-1}\boldsymbol{\gamma} - 1}{\mathbf{1}'\mathbf{\Gamma}^{-1}\mathbf{1}}$$

Kriging variance:

$$\sigma^2_{OK} = \mathbf{w}'\boldsymbol{\gamma} + \lambda$$