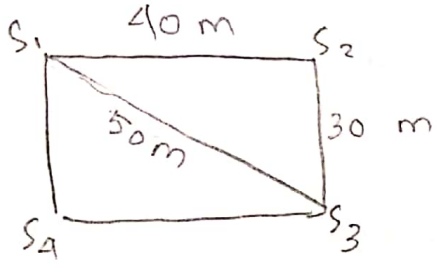
Suci Rama Wahyuni
1117094000058

Latihan per 26 Maret 2020

Diketahui $Z^* = \sum_{i=1}^{4} \lambda_i Z(s_i)$ dengan $\lambda_1 = \lambda_2 = 1$ dan $\lambda_3 = \lambda_4 = -1$ dan s_1, s_2, s_3, s_4 adalah titik sudut persegi panjang seperti gambar di bawah. Tentukan var (Z^*), jika diketahui variogram mengikuti model spherical dengan range = 100 m dan sill = 4 nugget effect = 1.



Dik:

$a = 100$

$C_0 = 1$

$C_0 + C = 4$

$C = 3$.

-> untuk $h = 40$

$$\gamma(h) = C_0 + C\left(\frac{3|h|}{2a} - \frac{|h|^3}{2a^3}\right)$$

$$\gamma(40) = 1 + 3\left(\frac{3(40)}{2(100)} - \frac{(40)^3}{2(100)^3}\right)$$

$\gamma(40) = 2,704$

$\gamma(h) = C(0) - C(h)$

$\gamma(40) = 1 - C(40)$

$C(40) = -1,704$.

-> untuk $h = 30$

$$\gamma(30) = 1 + 3\left(\frac{3(30)}{2(100)} - \frac{(30)^3}{2(100)^3}\right)$$

$= 1 + 3(0,45 - 0,0135)$

$= 2,3095$

$\gamma(h) = C(0) - C(h)$

$\gamma(30) = 1 - C(30)$

$C(30) = -1,3095$

-> Untuk $h = 50$

$$\gamma(50) = 1 + 3\left(\frac{3(50)}{2(100)} - \frac{(50)^3}{2(100)^3}\right)$$

$= 1 + 3(0,75 - 0,0625)$

$= 3,0625$

$\gamma(h) = C(0) - C(h)$

$\gamma(50) = 1 - C(50)$

$C(50) = 1 - 3,0625$

$= -2,0625$

o) $\text{Var}(Z^*) = \sum_{i=1}^{4} \sum_{j=1}^{4} \lambda_i \lambda_j C(s_i - s_j)$

$$= [\lambda_1\lambda_1 C(0) + \lambda_1\lambda_2 C(40) + \lambda_1\lambda_3 C(50) + \lambda_1\lambda_4 C(30)$$
$$+ \lambda_2\lambda_1 C(40) + \lambda_2\lambda_2 C(0) + \lambda_2\lambda_3 C(30) + \lambda_2\lambda_4 C(50)$$
$$+ \lambda_3\lambda_1 C(50) + \lambda_3\lambda_2 C(30) + \lambda_3\lambda_3 C(0) + \lambda_3\lambda_4 C(40)$$
$$+ \lambda_4\lambda_1 C(30) + \lambda_4\lambda_2 C(50) + \lambda_4\lambda_3 C(40) + \lambda_4\lambda_4 C(0)]$$

$$= [(1)(1)(1) + (1)(1)(-1,709) + (1)(-1)(-2,0625) + (1)(-1)(-1,3095)$$
$$+ (1)(1)(-1,709) + (1)(1)(1) + (1)(-1)(-1,3095) + (1)(-1)(-2,0625)$$
$$+ (-1)(1)(-2,0625) + (-1)(1)(-1,3095) + (1)(-1)(1) + (-1)(-1)(-1,709)$$
$$+ (-1)(1)(-1,3095) + (-1)(1)(-2,0625) + (-1)(-1)(-1,709) + (-1)(-1)(1)]$$

$$= 10,672 \;//$$