

COMPUTO EVOLUTIVO

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1. Estrategias evolutivas

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1. ESTRATEGIAS EVOLUTIVAS

Considere los siguientes problemas de Optimización Mono-Objetivo sin restricciones.

(1)

$$\underset{x}{\text{Minimizar}} \quad f(x) = -\frac{0.75}{1+x^2} - \left(0.65x \arctan\left(\frac{1}{x}\right)\right) + 0.65$$

(2)

$$\underset{x}{\text{Minimizar}} \quad f(x) = (-4x^2 - 20x - 100) + (1-x)^4$$

(3)

$$\underset{x}{\text{Minimizar}} \quad f(x) = 3x^2 + \frac{12}{x^3} - 5$$

(4)

$$\underset{x}{\text{Minimizar}} \quad f(x) = 3x^4 + x^2 - 2x + 1$$

(5)

$$\underset{x}{\text{Minimizar}} \quad f(x) = 10 + x^3 - 2x - 5e^x$$

(6)

$$\underset{x}{\text{Minimizar}} \quad f(x) = x^2 - 10e^{0.1x}$$

(7)

$$\underset{x}{\text{Minimizar}} \quad f(x) = (10x^3 + 3x^2 + 5)^2$$

(8)

$$\underset{x}{\text{Minimizar}} \quad f(x) = \frac{0.5}{\sqrt{1+x^2}} - \sqrt{1+x^2} \left(1 - \frac{0.5}{1+x^2}\right) + x$$

(9)

$$\underset{x}{\text{Minimizar}} \quad f(x) = e^x - x^3$$

(10)

$$\underset{x}{Minimize} \quad f(x) = (x^2 - 1)^3 - (2x - 5)^4$$

(11)

$$\underset{x}{Minimize} \quad f(x) = (-4x^2 - 20x - 100) + (1 - x)^4$$

(12)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = [x_1^2 + (x_2 + 1)^2][x_1^2 + (x_2 - 1)^2]$$

(13)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = (x_1^2 - x_2)^2 + x_2^2$$

(14)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = 50(x_2 - x_1^2)^2 + (2 - x_1)^2$$

(15)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = (x_1 + 2x_2 - 7)^2 + (2x_1 + x_2 - 5)^2$$

(16)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = [1.5 - x_1(1 - x_2)]^2 + [2.25 - x_1(1 - x_2^2)]^2 + [2.625 - x_1(1 - x_2^3)]^2$$

(17)

$$\underset{x}{Minimize}$$

$$f(x_1, x_2, x_3, x_4) = [10(x_2 - x_1^2)]^2 + (1 - x_1)^2 + 90(x_4 - x_3^2)^2 + (1 - x_3)^2 + 10(x_2 + x_4 - 2)^2 + 0.1(x_2 - x_4)$$

(18)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = \left(4 - 2.1x_1^2 + \frac{x_1^4}{3}\right)x_1^2 + x_1x_2 + (-4 + 4x_2^2)x_2^2$$

(19)

$$\underset{x}{Minimize} \quad f(x_1, x_2, x_3, x_4) = (x_1 + 10x_2)^2 + 5(x_3 - x_4)^2 + (x_2 - 2x_3)^4 + 10(x_1 - x_4)^4$$

(20)

$$\underset{x}{Minimize} \quad f(x_i) = \sum_{i=1}^3 x_i^2$$

(21)

$$\underset{x}{Minimize} \quad f(x_1, x_2) = 100(x_1^2 - x_2)^2 + (1 - x_1)^2$$

(22)

$$\underset{x}{Minimize} \quad f(x_i) = \sum_{i=1}^5 \lfloor x_i \rfloor$$

(23)

$$\underset{x}{Minimizar} \quad f(x_i) = \left(\sum_{i=1}^{30} ix_i^4 \right) + Gauss(0, 1)$$

(24)

$$\underset{x}{Minimizar}$$

$$f(x_i) = \frac{1}{\frac{1}{K} + \sum_{j=1}^{25} f_j^{-1}(x_1, x_2)}$$

donde :

$$f_j(x_1, x_2) = c_j + \sum_{i=1}^2 (x_i - a_{ij})^6$$

$$-65.536 \leq x_i \leq 65.536$$

$$K = 500$$

$$c_j = j$$

$$[a_{ij}] = \begin{bmatrix} -32 & -16 & -0 & 16 & 32 & -32 & -16 & 0 & \dots & 0 & 16 & 32 \\ -32 & -32 & -32 & -32 & -32 & -16 & -16 & -16 & \dots & 32 & 32 & 32 \end{bmatrix}$$