

A dark green vertical bar on the left side of the slide. A green arrow points to the right from the bar, containing the date.

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Hessiano

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Several thin, curved lines in dark green and light grey originate from the bottom left and curve upwards and to the right.

Evolutionary Computing

TRIGUEROS ROSAS JORGE LUIS

Problema 1

$$\begin{aligned}f(x, y) &= 4x + 2y - x^2 - 3y^2 \\ \partial f / \partial x &= 4 - 2x = 0 \Rightarrow x = 2 \\ \partial f / \partial y &= 2 - 6y = 0 \Rightarrow y = 1/3 \\ \nabla(f) &= (4 - 2x)\hat{i} + (2 - 6y)\hat{j} \\ H &= \begin{pmatrix} -2 & 0 \\ 0 & -6 \end{pmatrix} \quad | -2 | = -2 \neq 0\end{aligned}$$

Problema 2

$$\begin{aligned}f(x, y, z) &= e^{x-y} + e^{y-x} + e^{x^2} + z^2 = e^x e^{-y} + e^y e^{-x} + e^{x^2} + z^2 \\ \partial f / \partial x &= e^x e^{-y} - e^y e^{-x} + 2x e^{x^2} = 0 \\ \partial f / \partial y &= -e^x e^{-y} + e^y e^{-x} = 0 \\ \partial f / \partial z &= 2z = 0 \Rightarrow z = 0\end{aligned}$$

$x = 0$

$$\ln(e^y e^{-x}) = \ln(e^x e^{-y})$$
$$\begin{aligned}y - x &= x - y \\ 2y &= 2x \\ y &= x \\ y &= 0\end{aligned}$$

$$f = \begin{pmatrix} e^{x-y} + e^{y-x} + 4x^2e^{x^2} + 2e^{x^2} & -e^{x-y} - e^{y-x} & 0 \\ -e^{x-y} - e^{y-x} & e^{x-y} + e^{y-x} & 0 \\ 0 & 0 & 2 \end{pmatrix}$$

$$f(0,0,0) = \begin{pmatrix} 4 & -2 & 0 \\ -2 & 2 & 0 \\ 0 & 0 & 2 \end{pmatrix} \quad |M_1| = 4$$

$$|M_2| = 8 - 4 = 4$$

$$|M_3| = 16 + 0 + 0 - [0 + 0 + 8] = 8$$

Minimo
Local