

$$f = f(x_0) + f'(x_0)(x-x_0) + \frac{1}{2}f''(x_0)(x-x_0)^2 + \dots$$

$$f'(x) = f'(x_0) + f''(x_0)(x-x_0) + \dots$$

At minimum  $f'(x) = 0$

$$-f'(x_0) \approx f''(x_0)(x-x_0)$$

$$(x-x_0) = -f''(x_0)^{-1}f'(x_0)$$

$$x = x_0 - f''(x_0)^{-1}f'(x_0)$$

$$\vec{x}^{i+1} = \vec{x}^i - H(\vec{x}^i)^{-1} \nabla f(\vec{x}^i)$$