

(6.1)

$$y = ax + b;$$

$$d^2 = (x_0 - x)^2 + (y_0 - y)^2; \quad y - ax - b = 0$$

$$\text{minimize } L; \quad L = (x_0 - x)^2 + (y_0 - y)^2 - \lambda (y - ax - b)$$

$$\frac{\partial L}{\partial x} = 2(x_0 - x) + a\lambda = 0$$

$$\frac{\partial L}{\partial y} = 2(y_0 - y) - \lambda = 0$$

$$y - ax - b = 0 = \left(\frac{\lambda}{2} + y_0\right) + \left(\frac{a\lambda}{2} + x_0\right) - b$$

$$\lambda = \frac{2(b - x_0 - y_0)}{a^2 + 1}$$

$$x = \frac{a^2 x_0 + a(x_0 + y_0 - b)}{1 + a^2}, \quad y = \frac{a^2 y_0 + b - x_0}{a^2 + 1}$$