Distanza

Tra due punti

$P = (x_P, y_P, z_P),\ Q = (x_Q, y_Q, z_Q)$
$d(P, Q) = |\overrightarrow{PQ}| = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2 + (z_Q - z_P)^2}$

Tra un punto e un piano

$P = (x_P, y_P, z_P),\ \pi : ax + by + cz + d = 0$

$$d(P, \pi) = \frac{|a \cdot x_P + b \cdot y_P + c \cdot z_P + d|}{\sqrt{a^2 + b^2 + c^2}}$$

Tra un punto e una retta

$P = (x_P, y_P, z_P),\ r : (x_r, y_r, z_r) + t(x_t, y_t, z_t)$
$Q(t) = (x_r + tx_t,\ y_r + ty_t,\ z_r + tz_t)$
$\overrightarrow{PQ(t)} = (x_r + tx_t - x_P,\ y_r + ty_t - y_P,\ z_r + tz_t - z_P)$
Si impone $\overrightarrow{PQ(t)} \cdot (x_t, y_t, z_t) = 0$ trovando t_0
$d(P, r) = d(P, Q(t_0))$

Tra due rette

$r : (x_r, y_r, z_r) + t(x_t, y_t, z_t),\ r' : (x_{r'}, y_{r'}, z_{r'}) + s(x_s, y_s, z_s)$
Si impone

$$\begin{cases} \overrightarrow{P(t)Q(s)} \cdot (x_t, y_t, z_t) = 0 \\ \overrightarrow{P(t)Q(s)} \cdot (x_s, y_s, z_s) = 0 \end{cases}$$

trovando t_0 e s_0
$d(r, r') = d(P(t_0), Q(s_0))$