

Projektna prezentacija:

Elementarni postupak diferencijalnog praćenja

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Članovi grupe projekta:

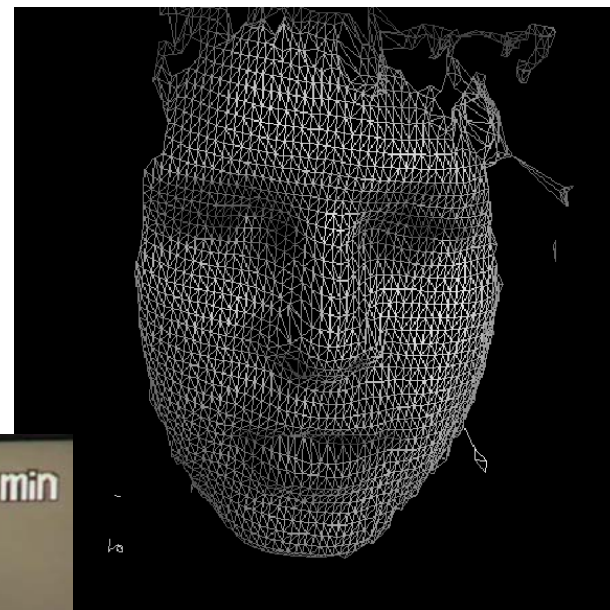
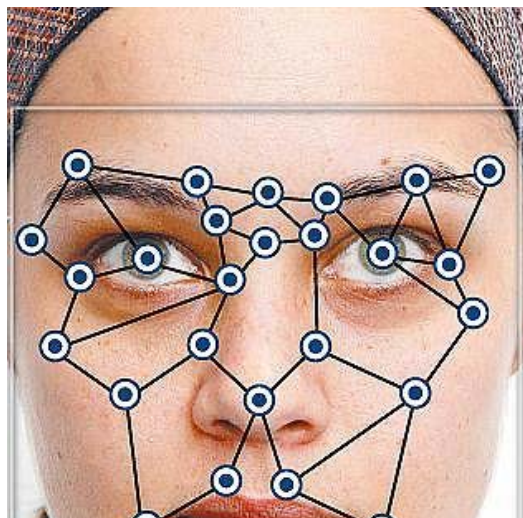
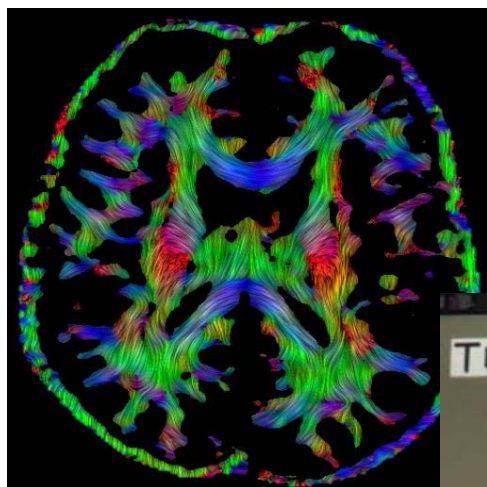
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Zagreb, 21.01.2014.

Računalni vid



Računalni vid



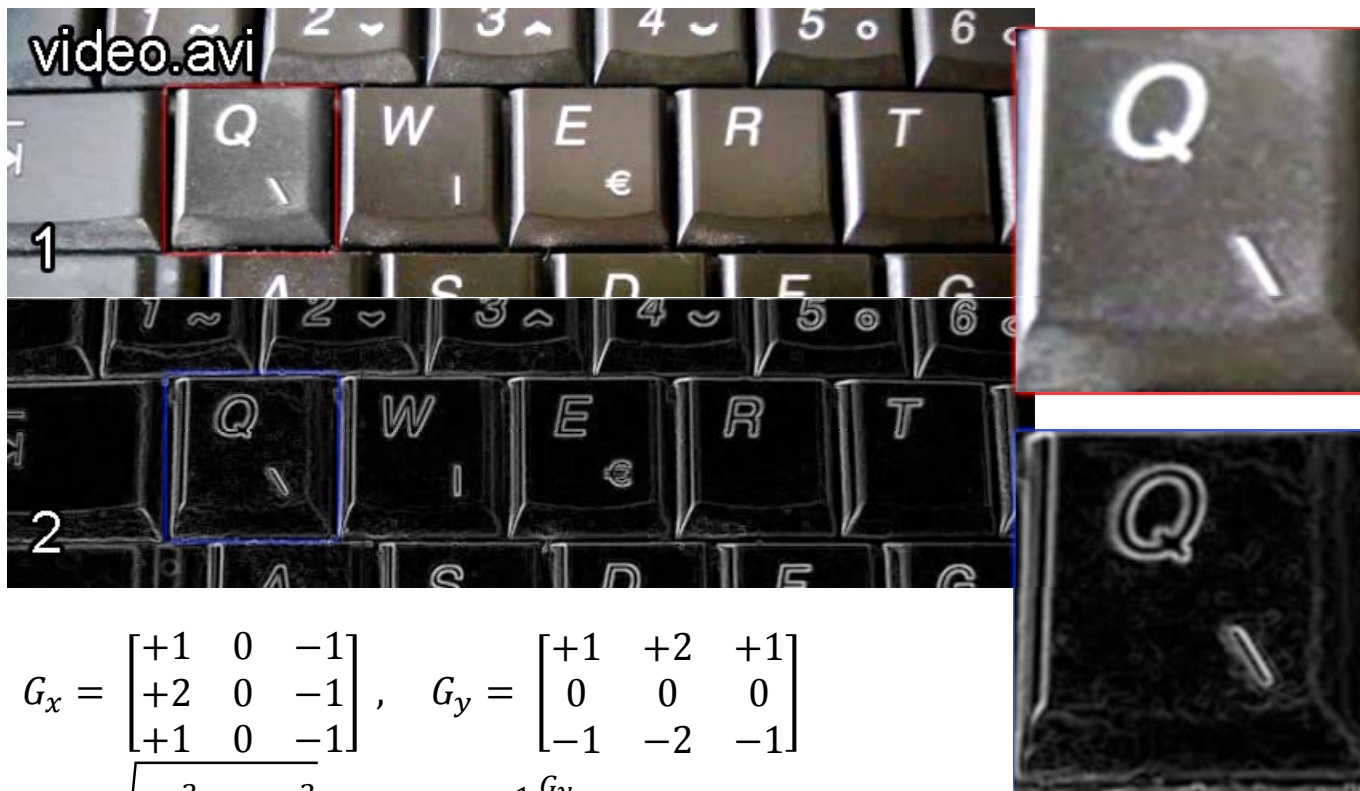
Obrada slike



Obrada slike

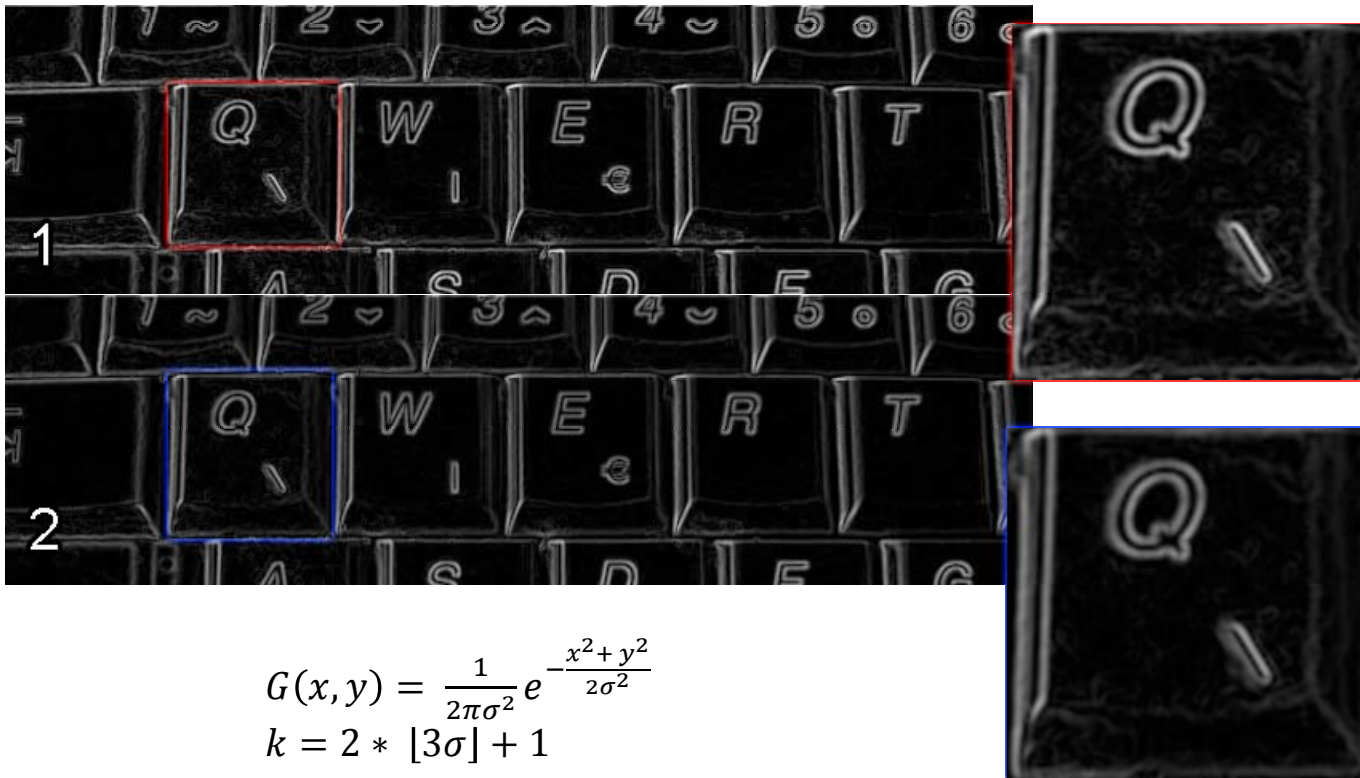


Obrada slike: računanje gradijenta



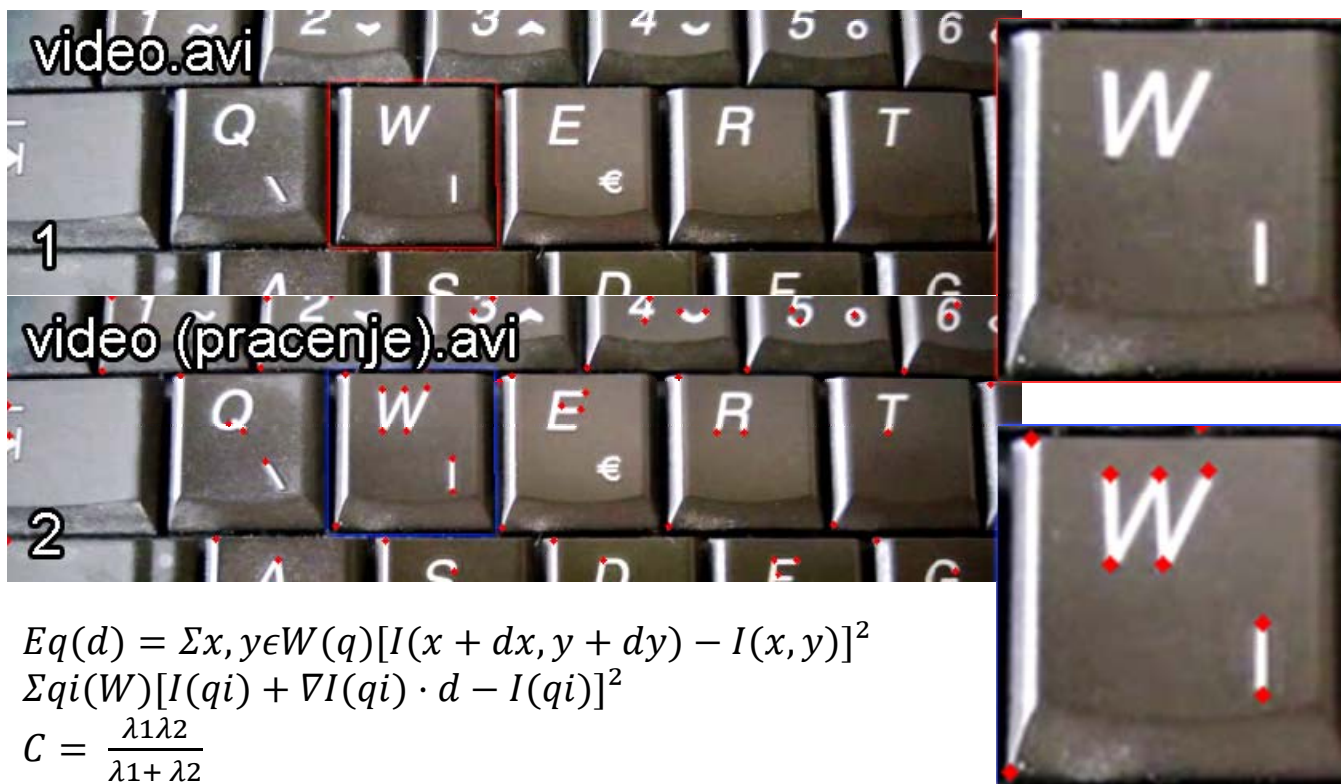
$$G_x = \begin{bmatrix} +1 & 0 & -1 \\ +2 & 0 & -1 \\ +1 & 0 & -1 \end{bmatrix}, \quad G_y = \begin{bmatrix} +1 & +2 & +1 \\ 0 & 0 & 0 \\ -1 & -2 & -1 \end{bmatrix}$$
$$G = \sqrt{G_x^2 + G_y^2}, \quad \theta = \tan^{-1} \frac{G_y}{G_x}$$

Obrada slike: zaglađivanje



$$G(x, y) = \frac{1}{2\pi\sigma^2} e^{-\frac{x^2+y^2}{2\sigma^2}}$$
$$k = 2 * \lfloor 3\sigma \rfloor + 1$$

Harrisovi kutovi



KLT algoritam

Korak 1:

$$\bar{u} = [u_x \quad u_y]^T$$

$$\bar{d} = [d_x \quad d_y]^T$$

$$\varepsilon(d_x, d_y) = \sum_{x=u_x-\omega_x}^{u_x+\omega_x} \sum_{y=u_y-\omega_y}^{u_y+\omega_y} (I(x, y) - J(x + d_x, y + d_y))^2$$

Korak 2:

$$I_x(x, y) = \frac{I(x+1, y) - I(x-1, y)}{2}$$

$$I_y(x, y) = \frac{I(x, y+1) - I(x, y-1)}{2}$$

KLT algoritam

Korak 3:

$$H = \sum_{x=u_x-\omega_x}^{u_x+\omega_x} \sum_{y=u_y-\omega_y}^{u_y+\omega_y} \begin{bmatrix} I_x^2(x, y) & I_x(x, y)I_y(x, y) \\ I_x(x, y)I_y(x, y) & I_y^2(x, y) \end{bmatrix}$$

Korak 4:

$$\bar{d} = [0 \quad 0]^T$$

KLT algoritam

Korak 5: $\leq K$

$$\delta I_k(x, y) = I(x, y) - J(x + d_x, y + d_y)$$

$$\bar{b}_k = \sum_{x=u_x-\omega_x}^{u_x+\omega_x} \sum_{y=u_y-\omega_y}^{u_y+\omega_y} \begin{bmatrix} \delta I_k(x, y) I_x(x, y) \\ \delta I_k(x, y) I_y(x, y) \end{bmatrix}$$

$$\bar{\eta}_k = H^{-1} \bar{b}_k \quad \bar{d}_k = d_{k-1} + \bar{\eta}_k$$

$$v = u + d$$

Prezentacija rezultata