

IDENTIFICAÇÃO DE ALVOS

Análise de alvos por forma ou textura

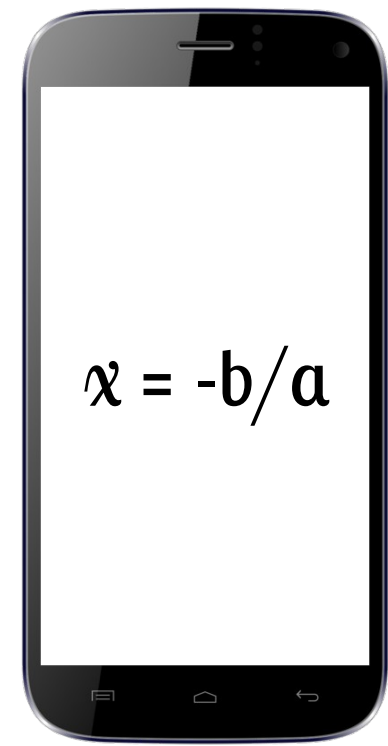
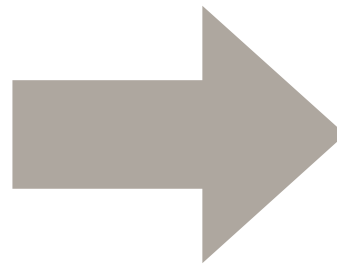
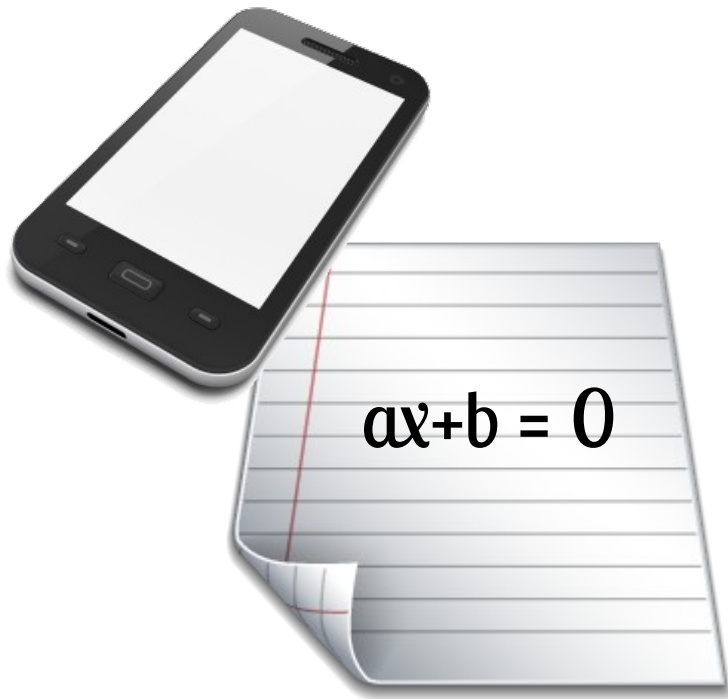


Aluno: Bruno Vieira Costa
Orientador: Carlos Frederico de Sá Volotão

MOTIVAÇÃO



PROJETO



METODOLOGIA

$$\begin{aligned}
 &X^2 + 8X - 65 = 0 \\
 &A=1, B=8, C=-65 \\
 &-\frac{B}{2A} \pm \sqrt{\frac{B^2}{4A^2} - \frac{C}{A}} \\
 &-\frac{8}{2} \pm \sqrt{\frac{8^2}{4} - \frac{(-65)}{1}} \\
 &-\frac{8}{2} \pm \sqrt{16 + 65} \\
 &-\frac{8}{2} \pm \sqrt{81} \\
 &-\frac{8}{2} \pm 9 \\
 &\frac{-8+18}{2} = \frac{10}{2} = 5 \\
 &\frac{-8-18}{2} = \frac{-26}{2} = -13
 \end{aligned}$$

Captura

$$\begin{aligned}
 &X^2 + 8X - 65 = 0 \\
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Tratamento

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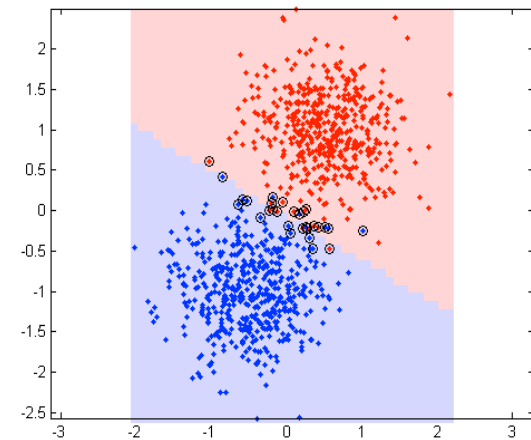
Limiarização

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Extração de bordas

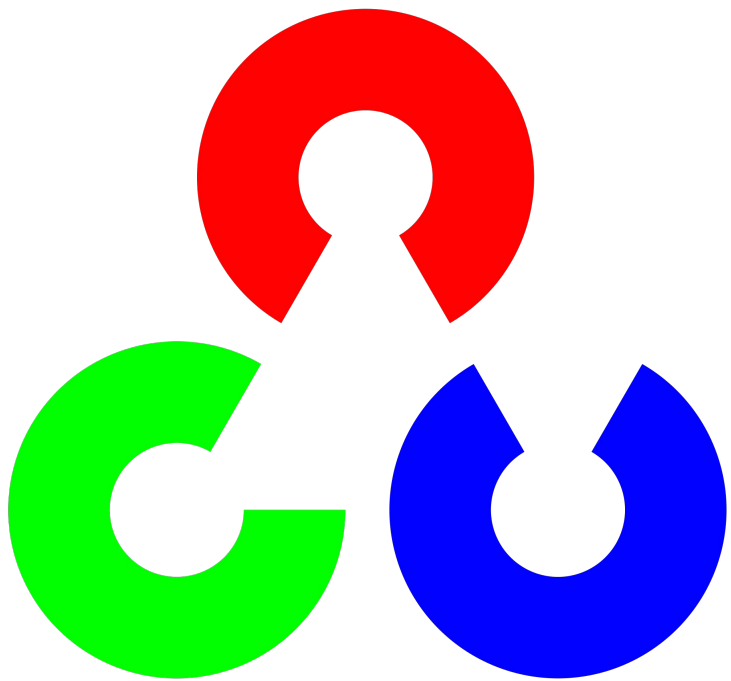


Descrição



Classificação

CAPTURA



OpenCV



android

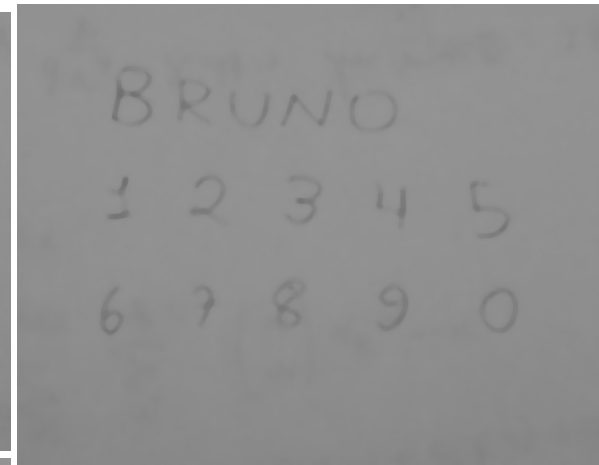
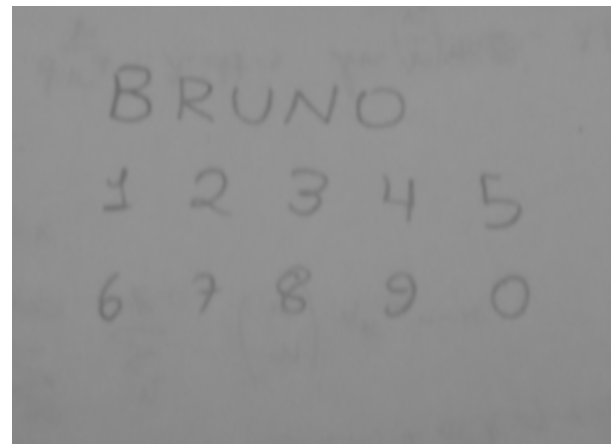
TRATAMENTO

Média

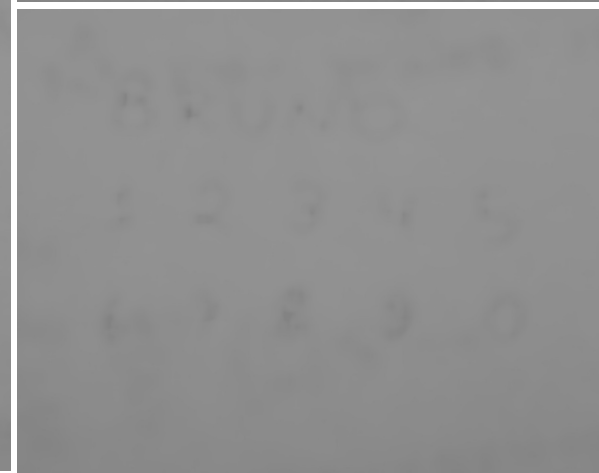
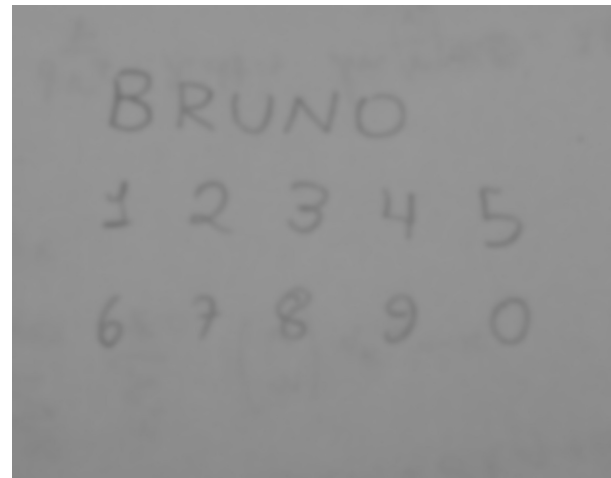
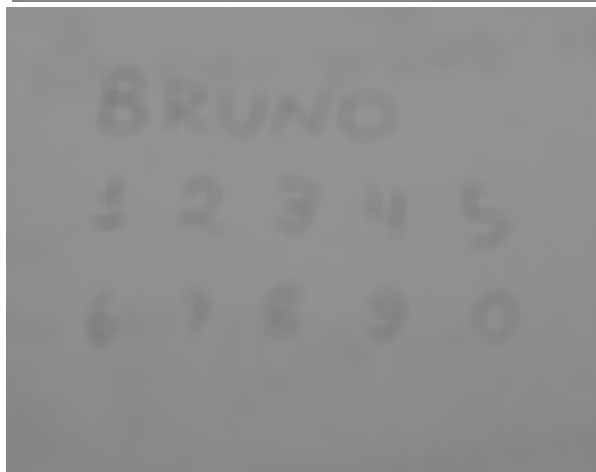
Gaussiana

Mediana

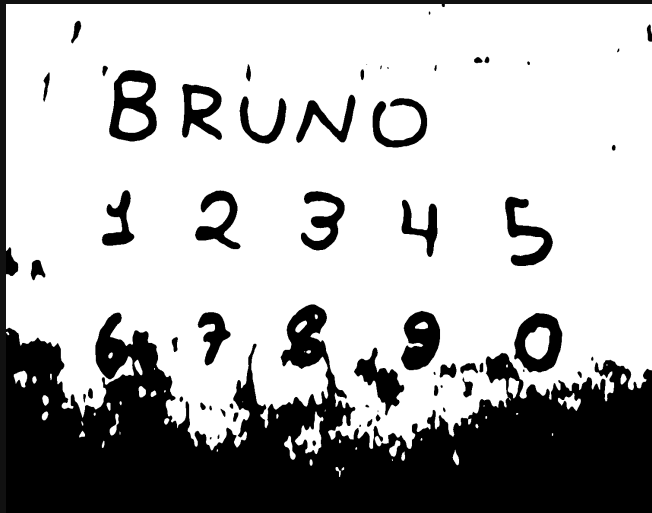
w=21



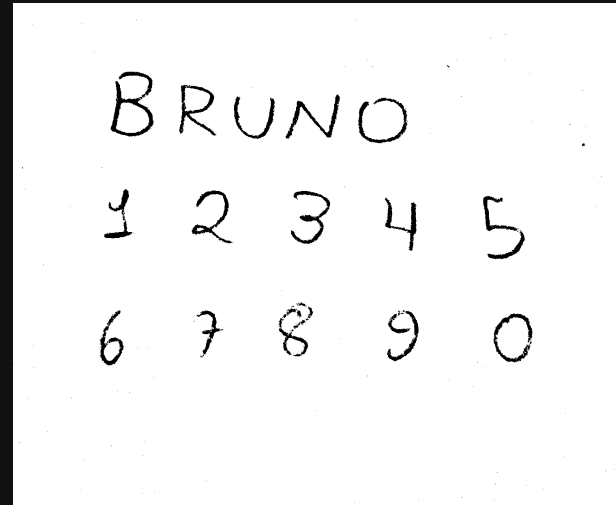
w=41



LIMIARIZAÇÃO



Threshold

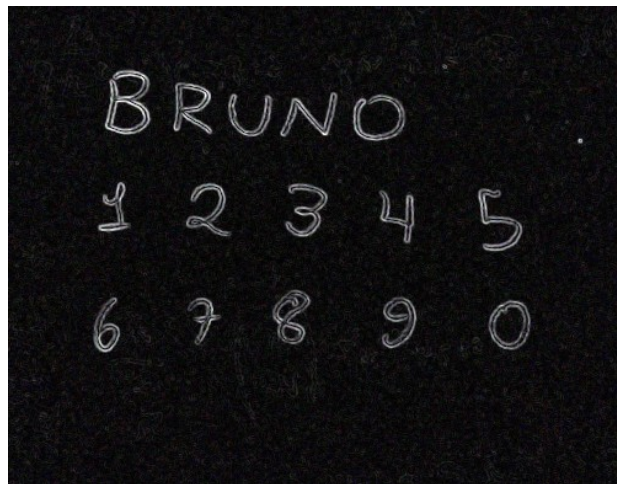


AdaptiveThreshold

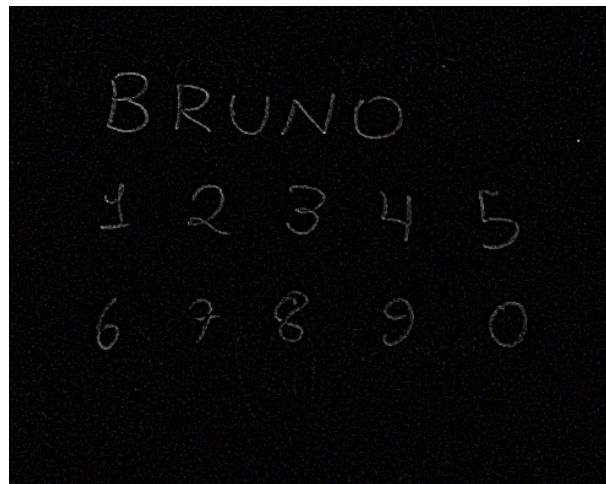
EXTRAÇÃO DE BORDAS

$$\mathbf{G}_x = \begin{bmatrix} -1 & 0 & +1 \\ -2 & 0 & +2 \\ -1 & 0 & +1 \end{bmatrix} * \mathbf{A} \quad \text{and} \quad \mathbf{G}_y = \begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ +1 & +2 & +1 \end{bmatrix} * \mathbf{A}$$

Sobel

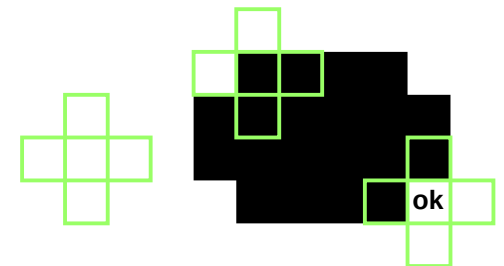
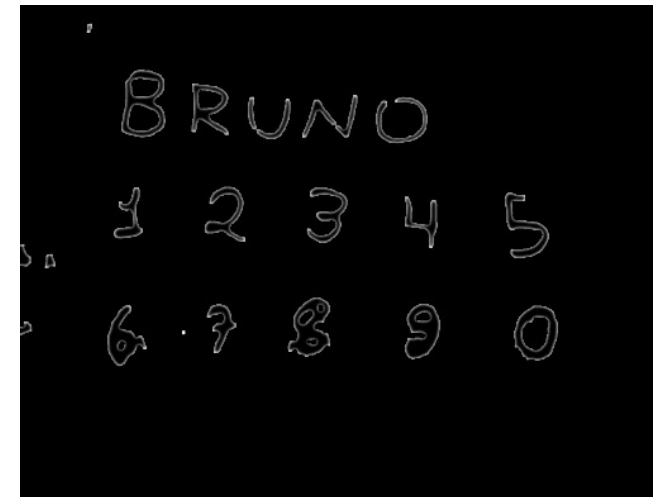


Laplaciano do Gaussiano

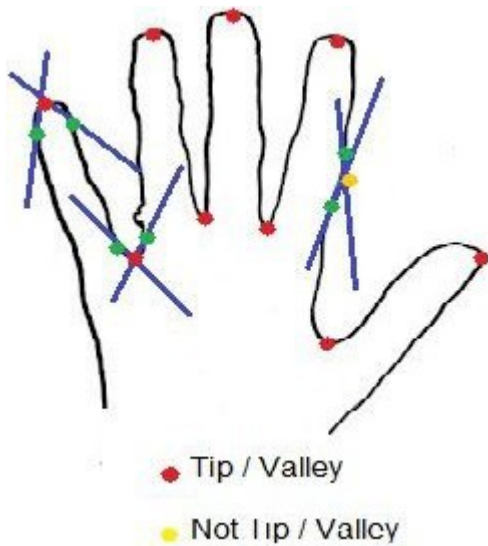


$$LoG(x, y) = -\frac{1}{\pi\sigma^4} \left[1 - \frac{x^2 + y^2}{2\sigma^2} \right] e^{-\frac{x^2 + y^2}{2\sigma^2}}$$

4-Vizinhança



DESCRIÇÃO



K-Curvatura

Momentos invariantes de Hu

$$\phi_1 = \eta_{20} + \eta_{02}$$

$$\phi_2 = (\eta_{20} - \eta_{02})^2 + (2\eta_{11})^2$$

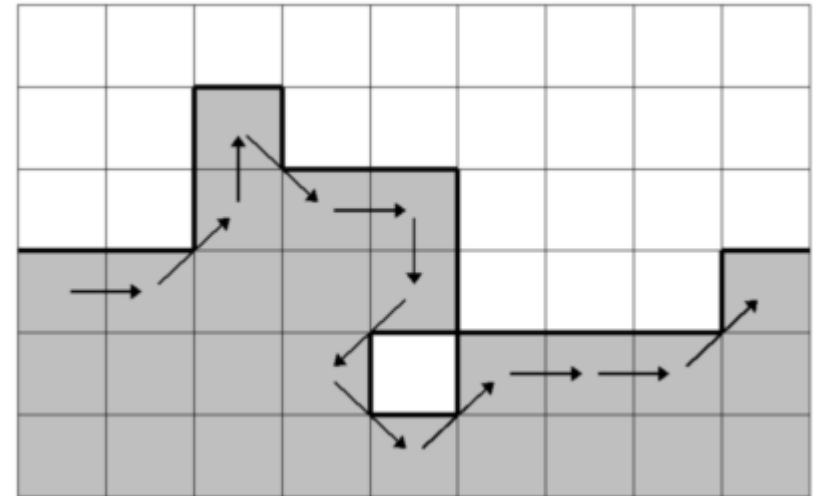
$$\phi_3 = (\eta_{30} - 3\eta_{12})^2 + (3\eta_{21} - \eta_{03})^2$$

$$\phi_4 = (\eta_{30} + \eta_{12})^2 + (\eta_{21} + \eta_{03})^2$$

$$\phi_5 = (\eta_{30} - 3\eta_{12})(\eta_{30} + \eta_{12})[(\eta_{30} + \eta_{12})^2 - 3(\eta_{21} + \eta_{03})^2] + (3\eta_{21} - \eta_{03})(\eta_{21} + \eta_{03})[3(\eta_{30} + \eta_{12})^2 - (\eta_{21} + \eta_{03})^2]$$

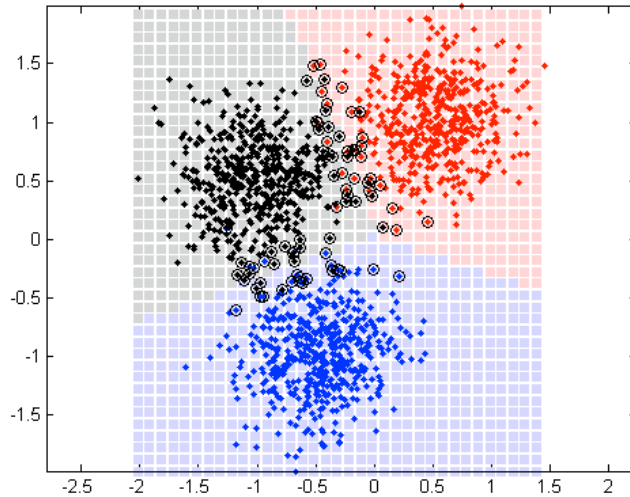
$$\phi_6 = (\eta_{20} - \eta_{02})[(\eta_{30} + \eta_{12})^2 - (\eta_{21} + \eta_{03})^2] + 4\eta_{11}(\eta_{30} + \eta_{12})(\eta_{21} + \eta_{03})$$

$$\phi_7 = (3\eta_{21} - \eta_{03})(\eta_{30} + \eta_{12})[(\eta_{30} + \eta_{12})^2 - 3(\eta_{21} + \eta_{03})^2] + (\eta_{30} - 3\eta_{12})(\eta_{21} + \eta_{03})[3(\eta_{30} + \eta_{12})^2 - (\eta_{21} + \eta_{03})^2].$$

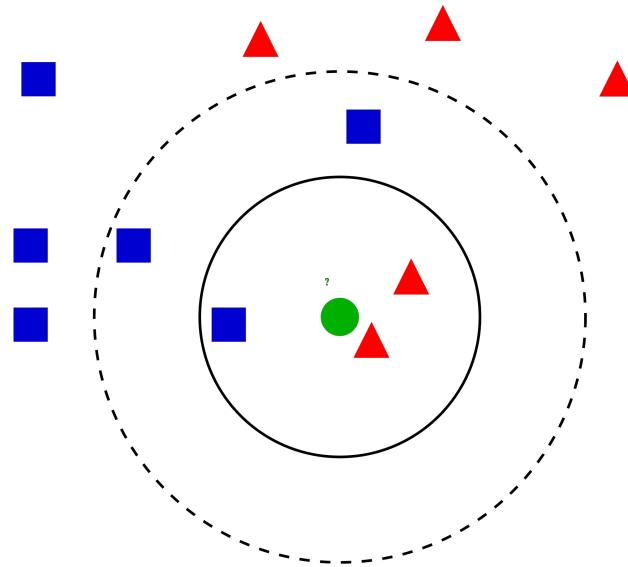


Chain code

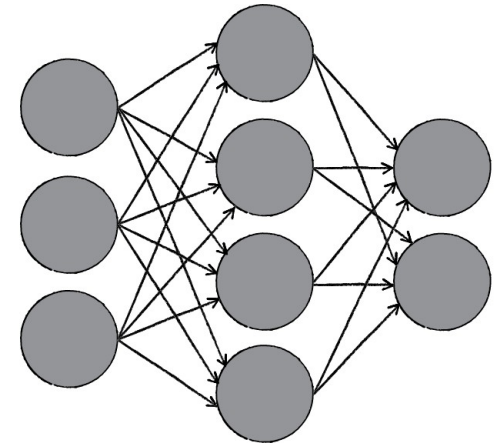
CLASSIFICAÇÃO



SVM



KNN



Redes neurais

IMPLEMENTAÇÃO

Atividades Qua, 20:24 pt

bruno@bruno-Aspire-E1-572: ~/workspace/pibiti/Release

imagem original

imagem cinza

imagem borrada

imagem binária

imagem fechada

imagem detectada

$$x^2 + 8x - 65 = 0$$
$$A = 1, B = 8, C = -65$$
$$-b \pm \sqrt{b^2 - 4ac}$$
$$-8 \pm \sqrt{8^2 - 4(1)(-65)}$$
$$-8 \pm \sqrt{64 + 260}$$
$$\frac{-8 \pm 18}{2}$$
$$\frac{-8 - 18}{2} = \frac{-26}{2} = -13$$
$$\frac{-8 + 18}{2} = \frac{10}{2} = 5 //$$

highgui/src/window.cpp, ht>0 in function imshow

Abortado (im
bruno@bruno-
init done
opengl suppo
OpenCV Error
e/bruno/open
terminate ca
what(): /
images in fu

1 and 32sC1

(x=317 v=129) ~ R:0 G:0 B:0

[illegible]