

# ESTUDO DE TÉCNICAS DE STITCHING DE IMAGENS DE MICROSCOPIA ÓPTICA COM POLARIZAÇÃO

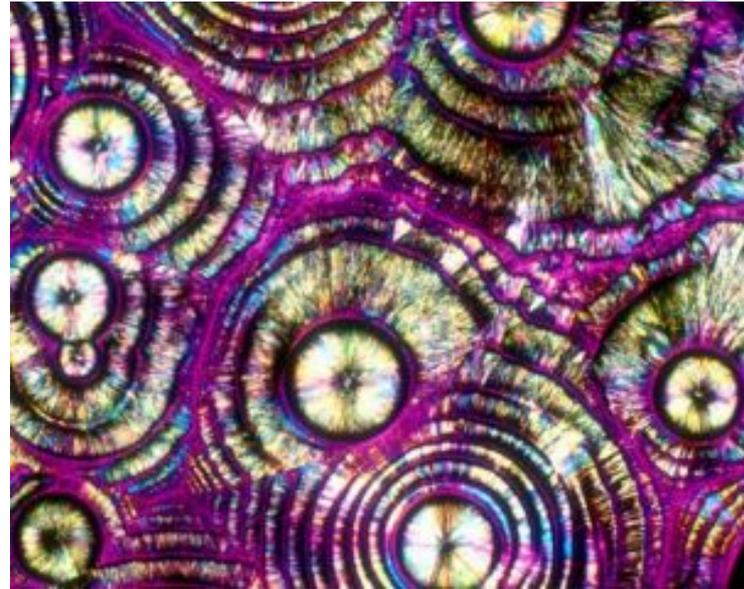
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# Microscopia Óptica de Polarização



[1]

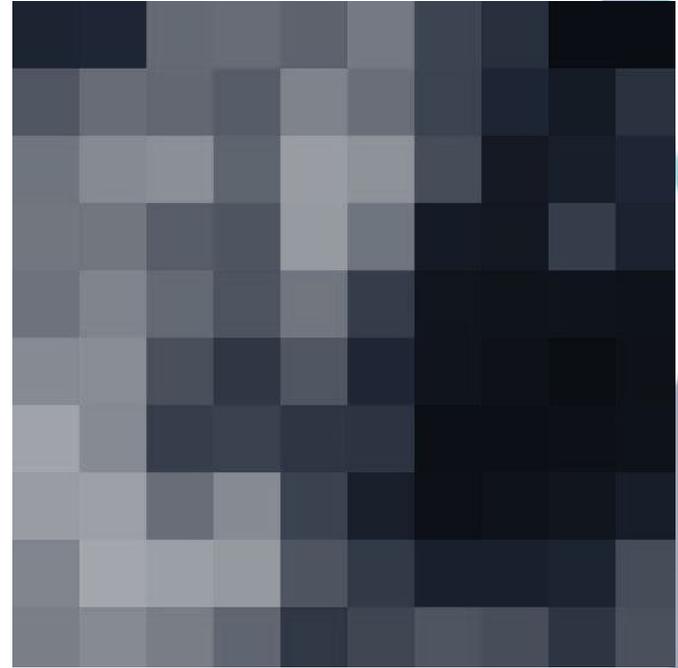


[2]

# Imagem Digital - Pixel



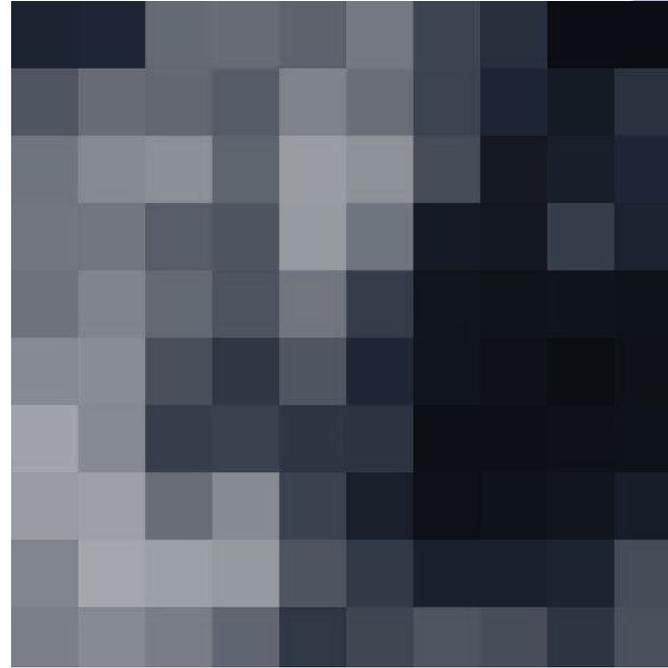
[3]



[3]

# Imagem Digital - Pixel

$$\begin{bmatrix} a_{0,0} & \cdots & a_{0,n} \\ \vdots & \ddots & \vdots \\ a_{m,0} & \cdots & a_{m,n} \end{bmatrix}$$



[3]

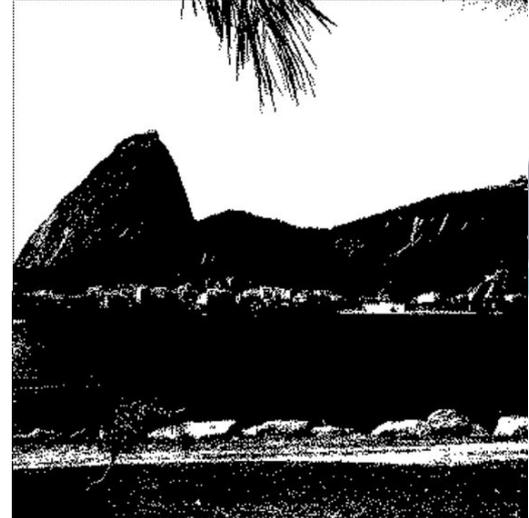
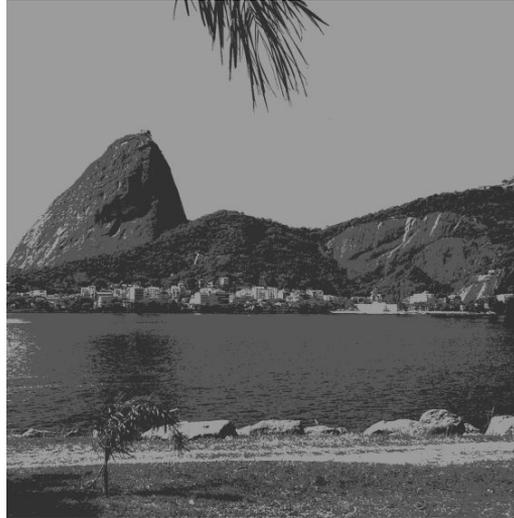
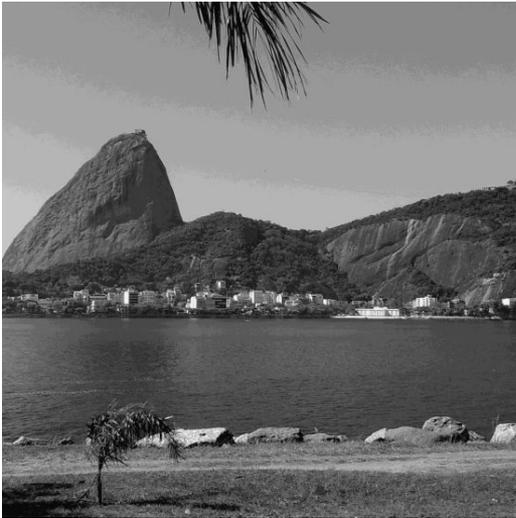
# Imagem Digital - Pixel

$$1 \text{ Bit} : a_{x,y} \in \{0, 1\}$$

$$2 \text{ Bits} : a_{x,y} \in \{0, 1, 2, 3\}$$

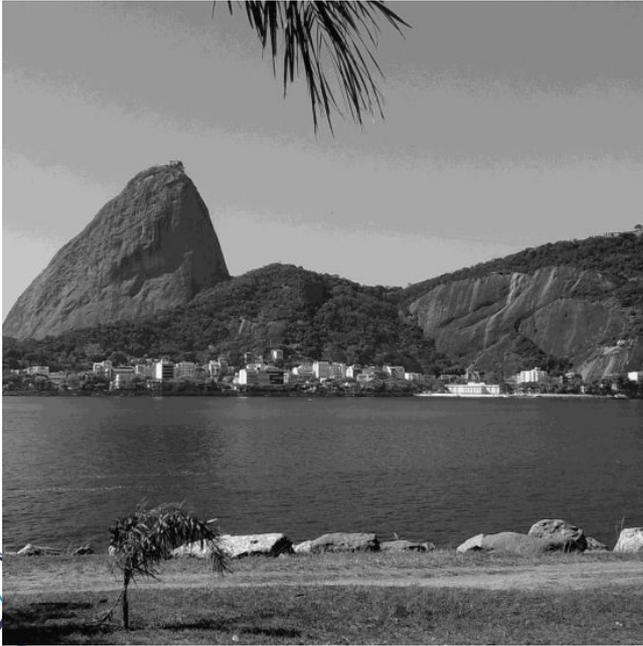
$$n \text{ Bits} : a_{x,y} \in \{0, 1, 2, \dots, 2^n - 1\}$$

# Imagem Digital - Pixel

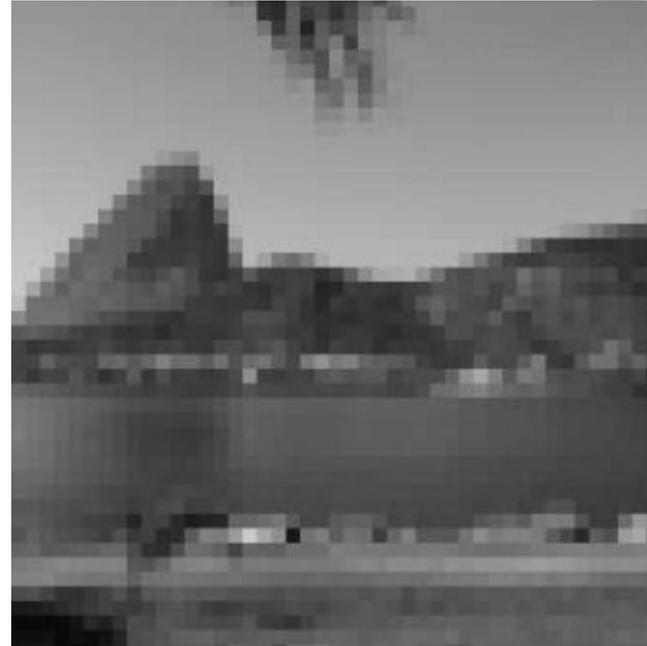


[4]

# Imagem Digital - Pixel

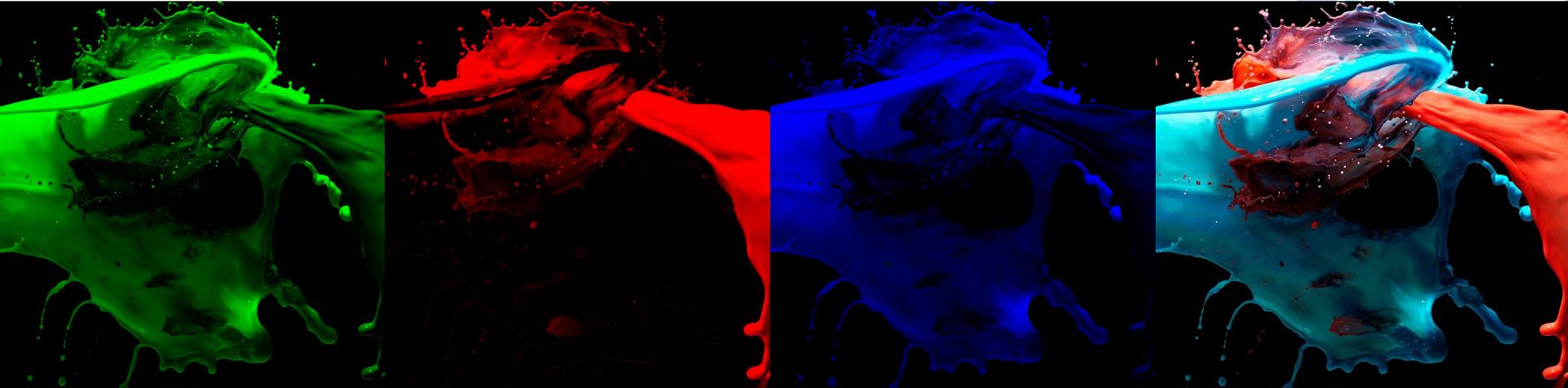


[4]



[4]

# Imagem Digital - Pixel



[7]

# Imagem Digital - Operações



[4]

# Imagem Digital - Operações



# Imagem Digital - Operações



# Imagem Digital - Operações



# Transformada de Fourier

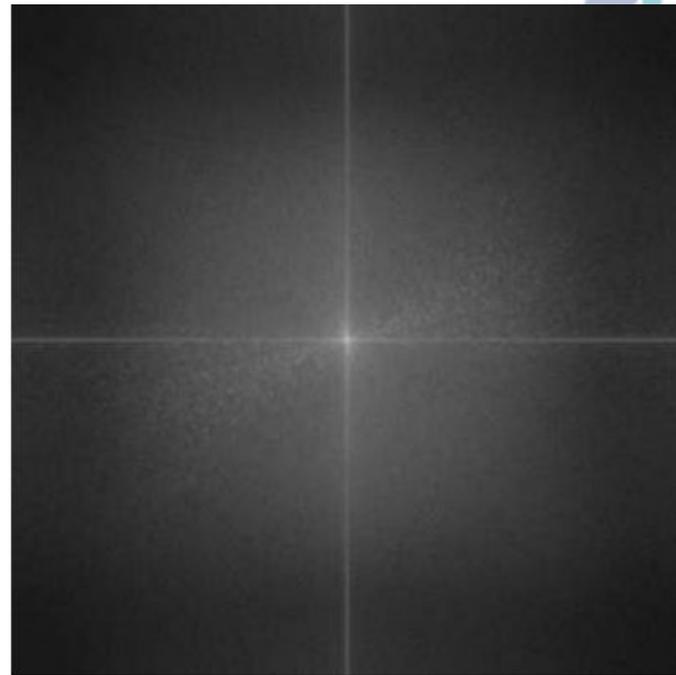
$$\hat{F}(w) = \int_{-\infty}^{\infty} f(t) e^{-i\omega t} dt$$

# Transformada de Fourier Discreta

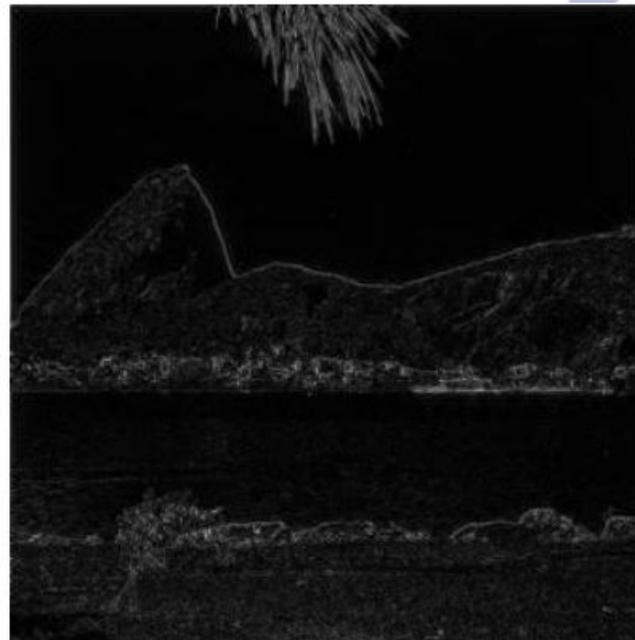
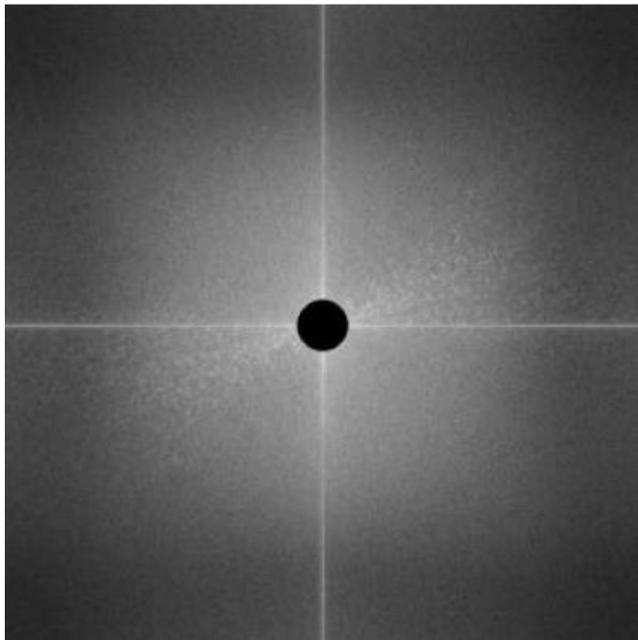
$$\hat{X}[w] = \sum_{t=-\infty}^{\infty} x[t] e^{-iwt}$$

$$\hat{X}[p, q] = \sum_{m=-\infty}^{\infty} \sum_{n=-\infty}^{\infty} x[m, n] e^{-ipm} e^{-iqn}$$

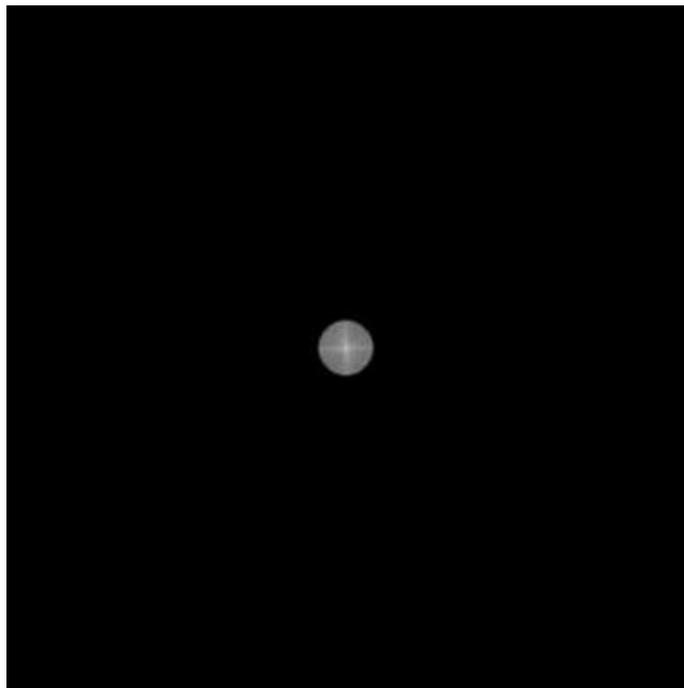
# TFD - Operações



# TFD - Operações



# TFD - Operações



[4]

# TFD - Operações

$$\hat{M}[x, y] = \hat{X}_1[x, y] \cdot \hat{X}_2[x, y]$$

## TFD - Operações

$$\hat{X}_1[\vec{k}] = \hat{X}_2[\vec{k} + \vec{L}]$$

$$\hat{M}[\vec{w}] = e^{i\vec{w} \cdot \vec{L}} ||\hat{X}_1[\vec{w}]||^2$$

## TFD - Aplicações

$$\hat{X}_1[\vec{k}] = \hat{X}_2[\vec{k} + \vec{L}]$$

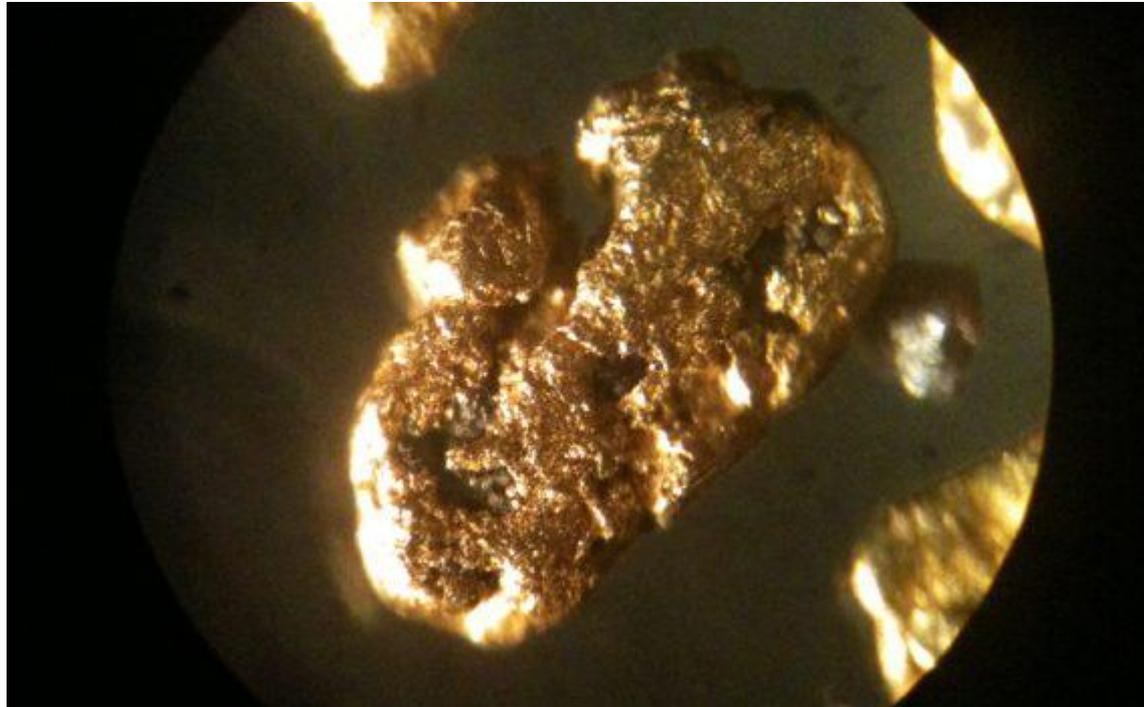
$$m[\vec{k}] = \delta[\vec{k} + \vec{L}]$$

## TFD - Aplicações

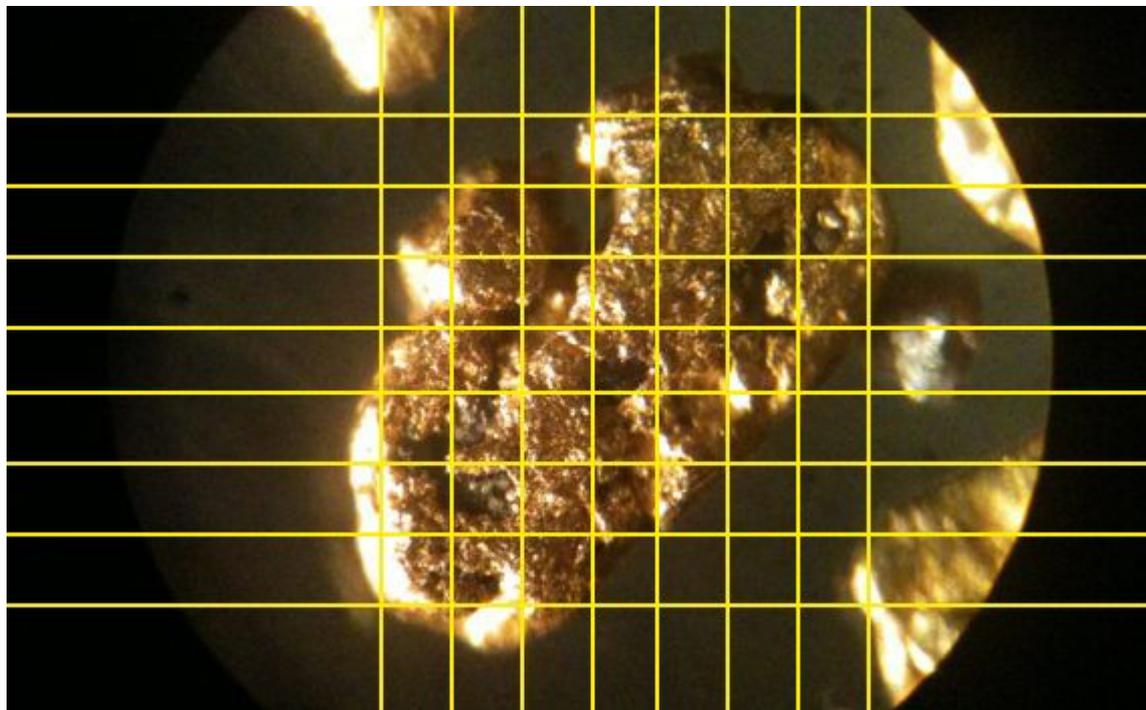
$$m[\vec{k}] = \delta[\vec{k} + \vec{L}]$$

$$\delta[\vec{k}] = \begin{cases} \infty ; & \vec{k} = \vec{0} \\ 0 ; & \text{Caso Contrário} \end{cases}$$

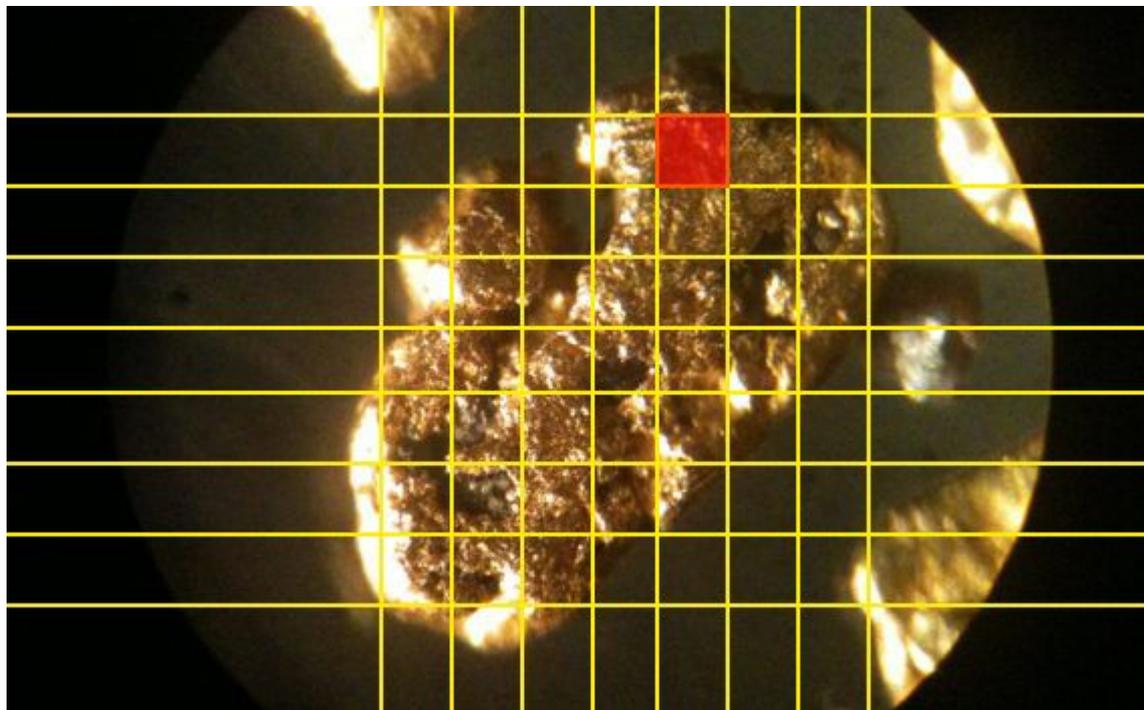
# TFD - Aplicações



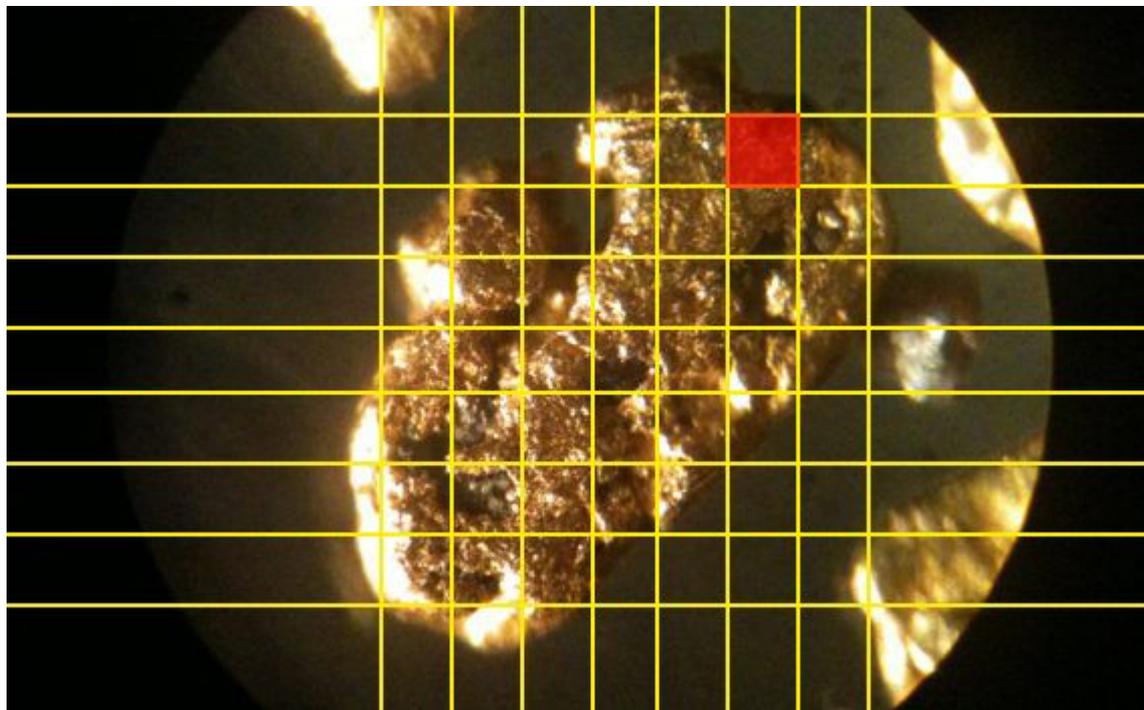
# TFD - Aplicações



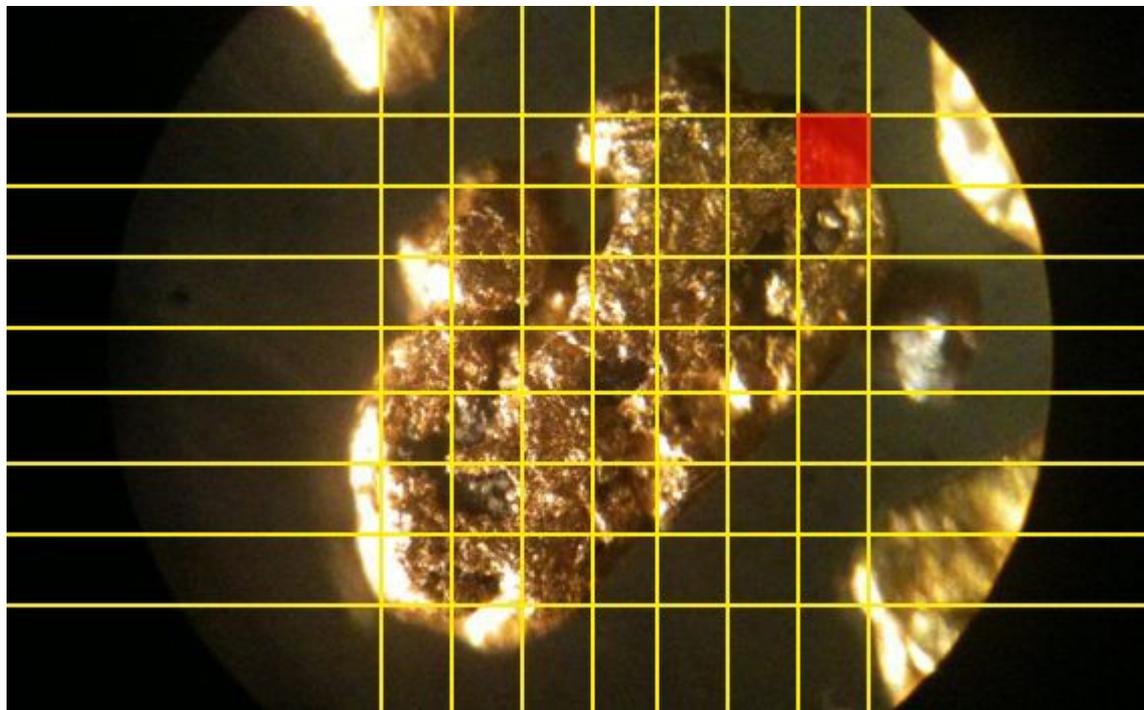
# TFD - Aplicações



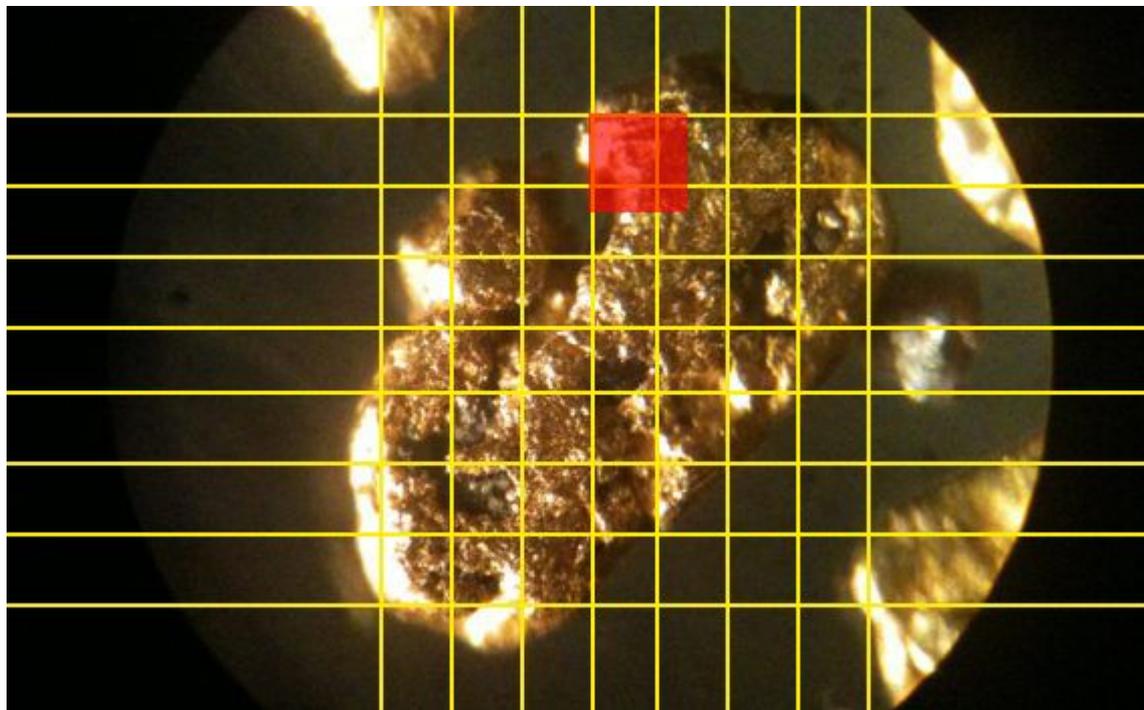
# TFD - Aplicações



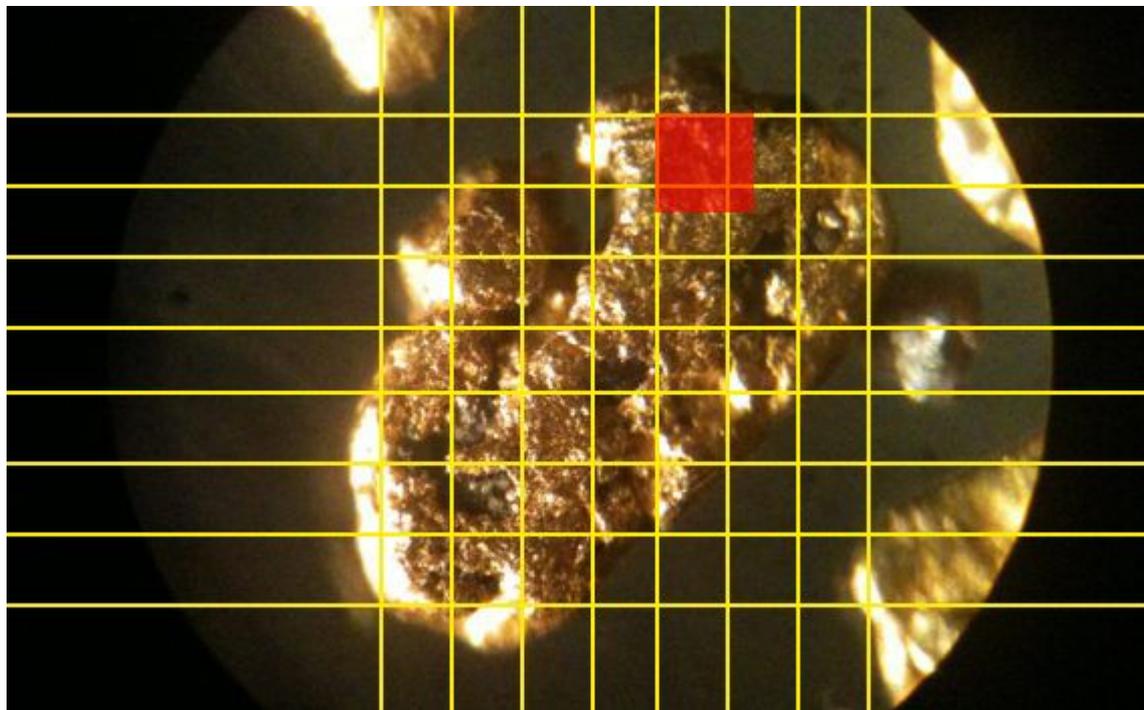
# TFD - Aplicações



# TFD - Aplicações



# TFD - Aplicações



# TFD - Aplicações

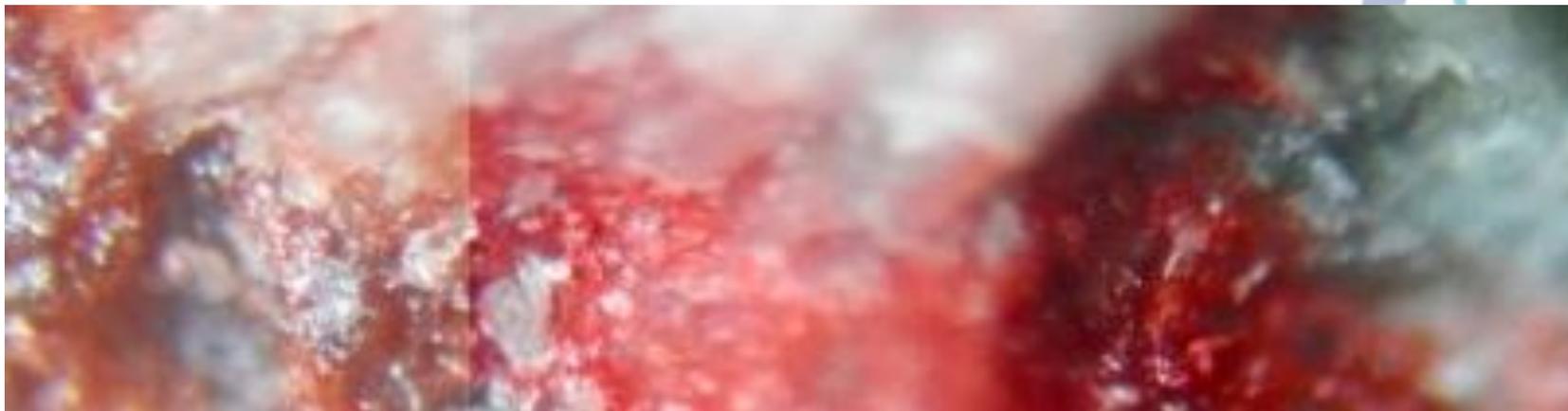


(A)



(B)

# TFD - Aplicações



[6]

$$C = A$$

# TFD - Aplicações



[6]

$$C = B$$

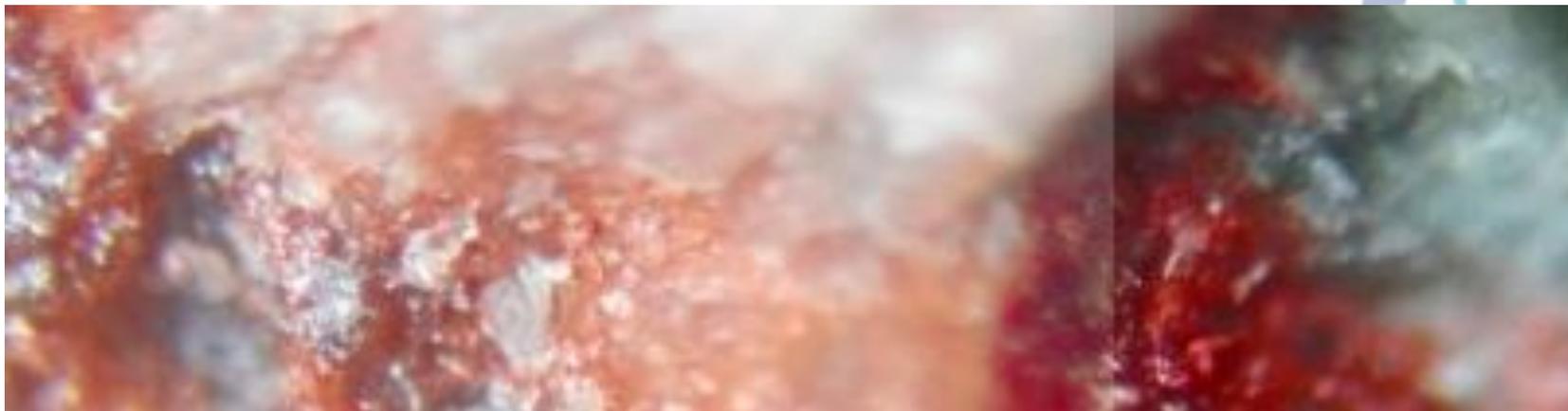
# TFD - Aplicações



[6]

$$C = A + B$$

# TFD - Aplicações



[6]

$$C = \text{MIN}(A, B)$$

# TFD - Aplicações



$$\begin{cases} R_s = 255 - \frac{(255-A)(255-B)}{255} \\ C = 255 - \frac{(255-A)B + R_s}{255} A \end{cases}^{[6]}$$

# Referências

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