Tratamiento de Señales

Version 2021-2

Operaciones Aritméticas y Lógicas

[Capítulo 3]

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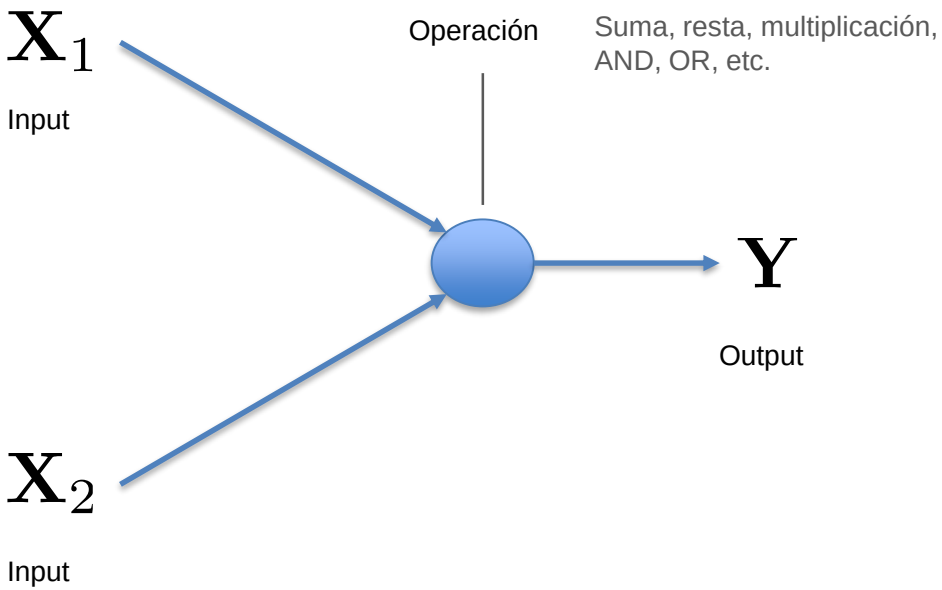
Director Semillero TRIAC
Ingenieria Electronica
Universidad Popular del Cesar

Operaciones Aritméticas y Lógicas



Suma (ponderada) $\mathbf{Y} = a_1\mathbf{X}_1 + a_2\mathbf{X}_2$

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$\mathbf{X}_1$

$\mathbf{X}_2$

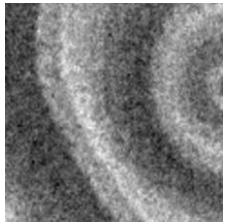
Suma (ponderada) $\mathbf{Y} = a_1\mathbf{X}_1 + a_2\mathbf{X}_2$

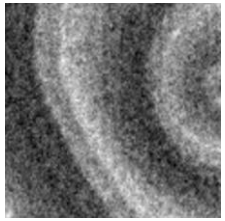
$\mathbf{Y}$  $= 0.5\times$ $\mathbf{X}_1$  $+0.5\times$ $\mathbf{X}_2$ 

Suma - Promedio $$\mathbf{Y} = \frac{1}{n} \sum_{i=1}^{n} \mathbf{X}_i$$

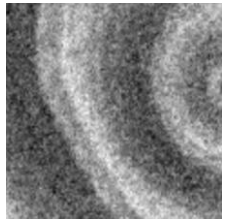
Suma - Promedio

$$\mathbf{Y} = \frac{1}{n}\sum_{i=1}^{n}\mathbf{X}_i$$

$\mathbf{X}_1$ 

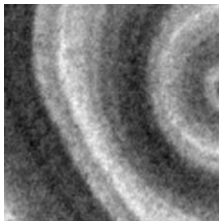
$\mathbf{X}_2$ 

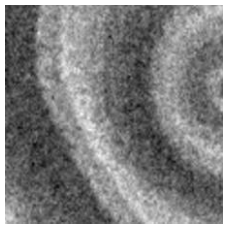
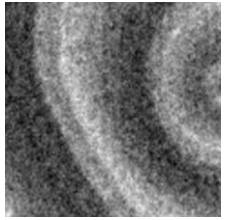
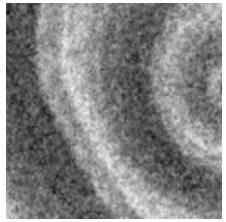
...

$\mathbf{X}_n$ 

Suma - Promedio

$$\mathbf{Y} = \frac{1}{n}\sum_{i=1}^{n}\mathbf{X}_i$$

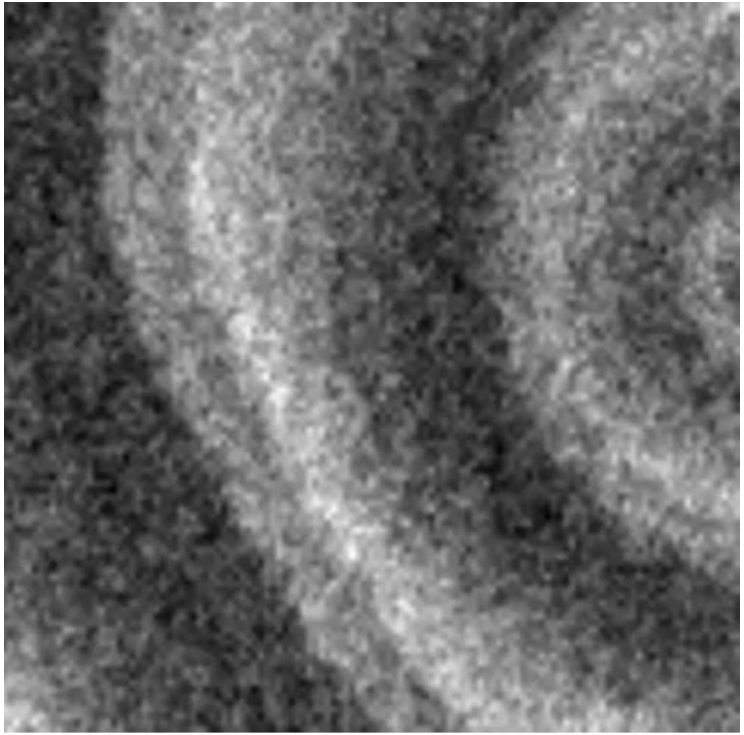
$\mathbf{Y}$ 

$= \frac{1}{n}\Big[$ $\mathbf{X}_1$  $+$ $\mathbf{X}_2$  $+ \cdots +$ $\mathbf{X}_n$  $\Big]$

Suma - Promedio

$$\mathbf{Y} = \frac{1}{n}\sum_{i=1}^{n}\mathbf{X}_i$$

$\mathbf{Y}$



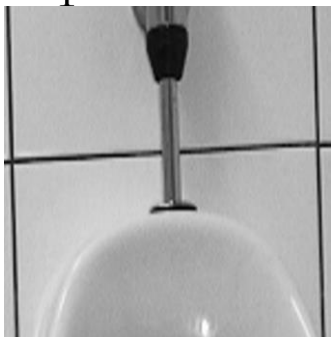
Si cada imagen tiene un ruido aditivo con media cero, entonces al promediar las imágenes, el ruido tiende a desaparecer.

La relación señal a ruido se incrementa en $\sqrt{n}$.

Resta $\mathbf{Y} = \mathbf{X}_1 - \mathbf{X}_2$

Resta $\mathbf{Y} = \mathbf{X}_1 - \mathbf{X}_2$

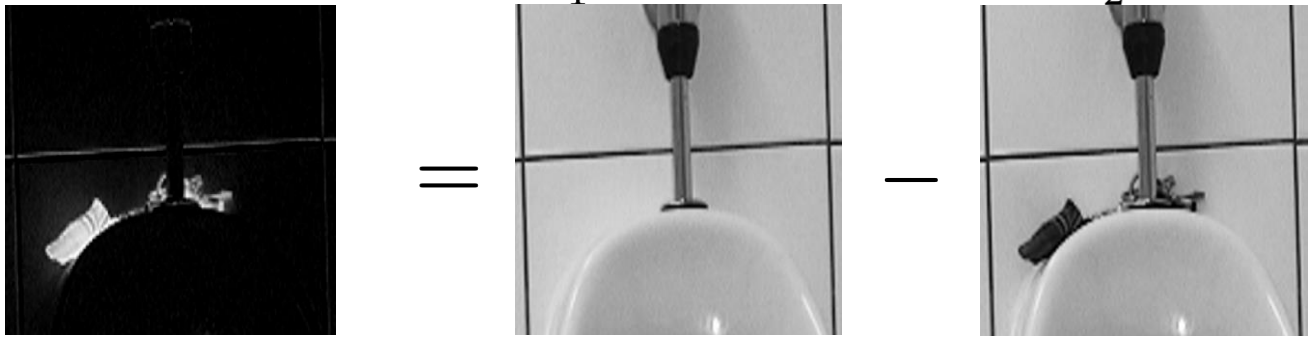
$\mathbf{X}_1$



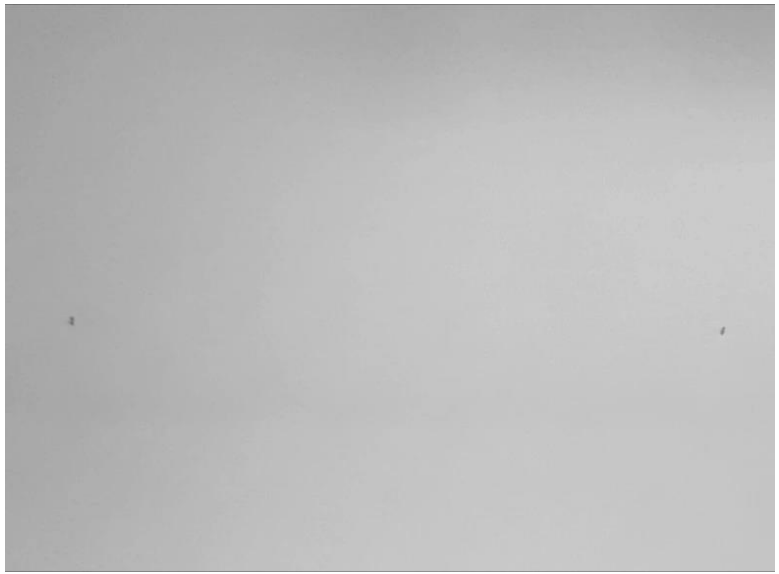
$\mathbf{X}_2$

Resta $\mathbf{Y} = \mathbf{X}_1 - \mathbf{X}_2$

$\mathbf{Y}$ $\mathbf{X}_1$ $\mathbf{X}_2$



Resta: Detección en Videos



Resta: Detección en Videos

$$\mathbf{D} = |\mathbf{X}_t - \mathbf{X}_0| > \theta$$

Resta: Detección en Videos

Resta: Detección en Videos

Multiplicación $\mathbf{Y} = k\mathbf{X}_1$

Multiplicación

$$\mathbf{Y} = k\mathbf{X}_1$$

$\mathbf{Y}$

$$= \frac{1}{2} \times$$

$\mathbf{X}_1$

Multiplicación

$$\mathbf{Y} = k\mathbf{X}_1$$

$\mathbf{Y}$

$= 2\times$

$\mathbf{X}_1$

Multiplicación

$$\mathbf{Y} = k\mathbf{X}_1$$

$\mathbf{Y}$

$= 3\times$

$\mathbf{X}_1$

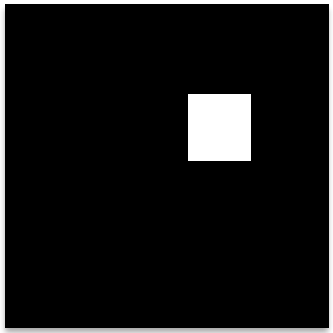
Multiplicación $\mathbf{Y} = \mathbf{X}_1 . * \mathbf{X}_2$

Multiplicación

$$\mathbf{Y} = \mathbf{X}_1 .* \mathbf{X}_2$$

$\mathbf{X}_1$

$\mathbf{X}_2$



Multiplicación $\mathbf{Y} = \mathbf{X}_1 .* \mathbf{X}_2$

$\mathbf{Y}$ $\mathbf{X}_1$ $\mathbf{X}_2$

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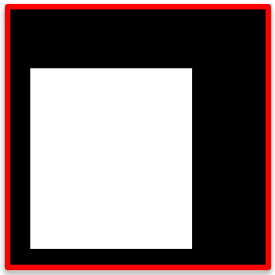
$\mathbf{Y}$ $\mathbf{X}_1$ $\mathbf{X}_2$

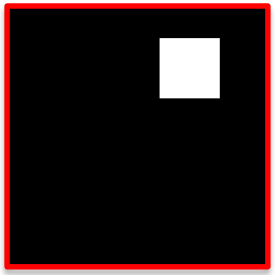
Operaciones Lógicas

Operaciones Lógicas

A

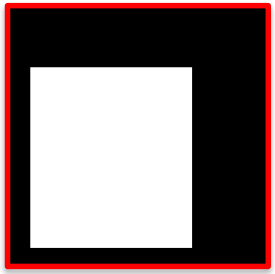


B

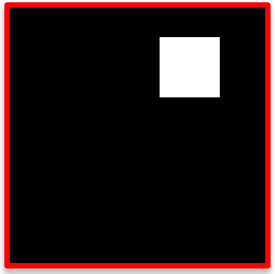


Operaciones Lógicas

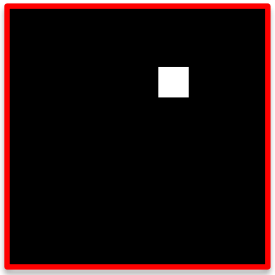
A



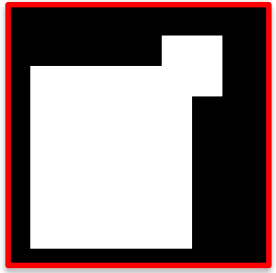
B



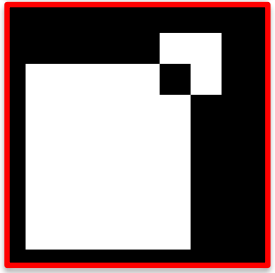
AND(A,B)



OR(A,B)

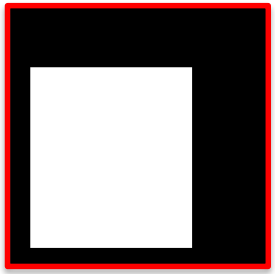


XOR(A,B)

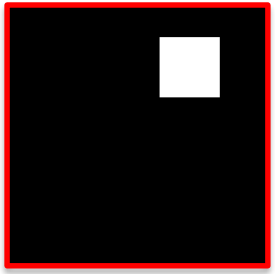


Operaciones Lógicas

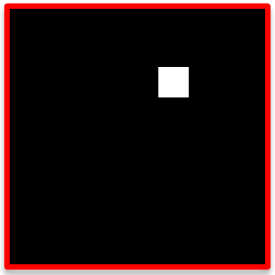
A



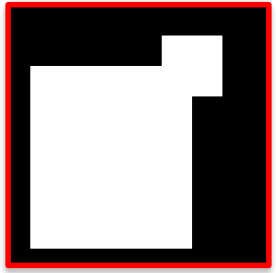
B



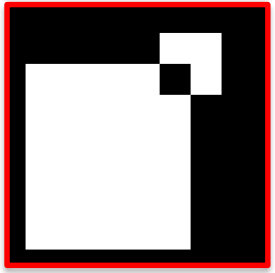
AND(A,B)



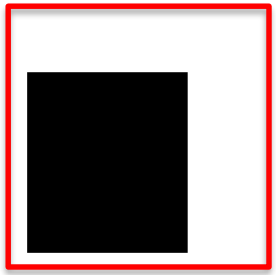
OR(A,B)



XOR(A,B)



C = NOT(A)



AND(C,B)