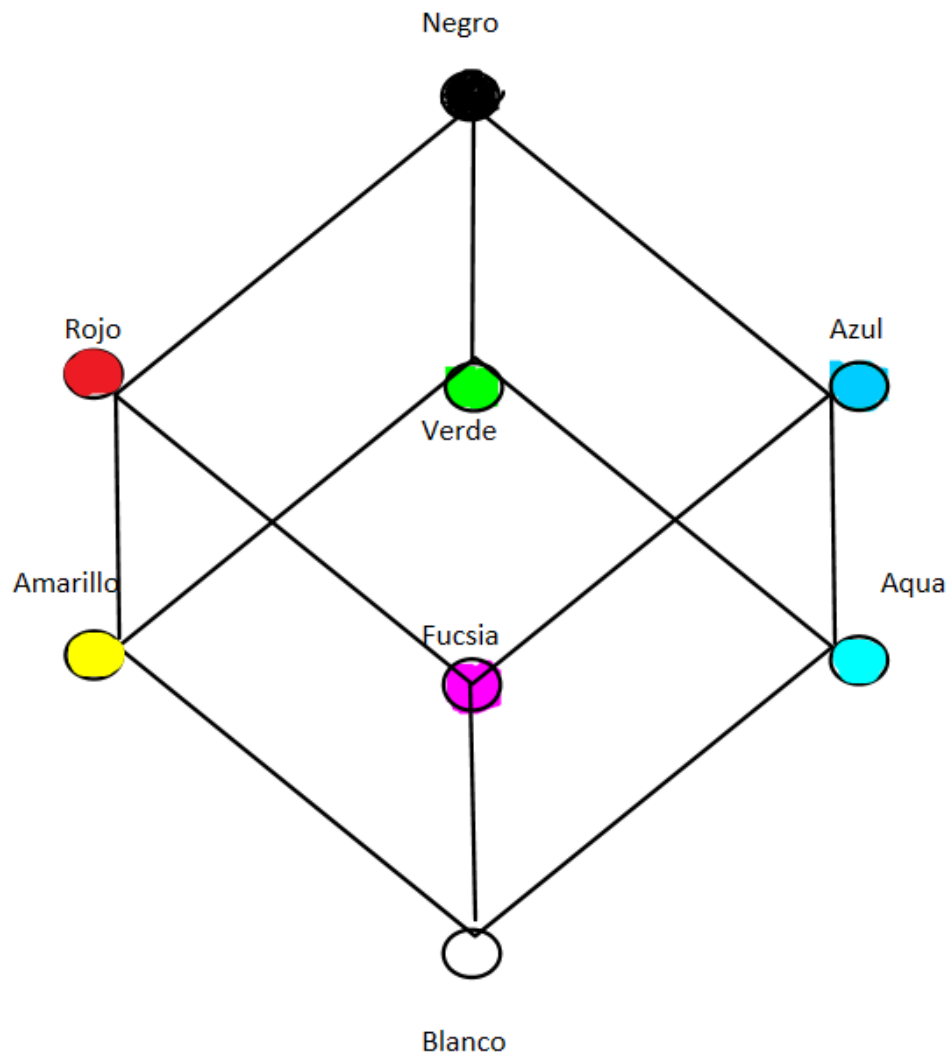


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ESQUEMA DE RETÍCULOS Y ÁLGEBRA DE BRAUER PARA CRIPTOGRAFÍA VISUAL



Criptografía visual:

$N = (0, 0, 0)$

$BI = (255, 255, 255)$

$R = (255, 0, 0)$

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Az = (0, 0, 255)

V = (0, 255, 0)

Aq = (0, 255, 255)

F = (255, 0, 255)

Am = (255, 255, 0)

Matrices de encriptación:

#NEGRO

Y_N=[[N,N,N,N], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_N=[[[N,R,N,N], [V,N,N,N], [N,Az,N], [Bl,N,N,N]], [[N,N,V,N], [N,N,R,N], [N,N,N,Bl], [N,N,Az,N]]]

#ROJO

Y_R=[[N,N,N,R], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_R=[[[N,N,N,R], [N,V,N,N], [N,Az,N,N], [N,N,N,Bl]], [[N,N,N,Bl], [V,N,N,N], [N,N,R,N], [N,N,Az,N]]]

#AZUL

Y_Az=[[N,N,N,Az], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_Az=[[[N,N,N,Az], [N,N,N,R], [N,N,N,V], [N,N,N,Bl]], [[N,N,N,Bl], [N,N,R,N], [Az,N,N,N], [V,N,N,N]]]

#VERDE

Y_V=[[N,N,N,V], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_V=[[[N,N,N,V], [N,N,N,R], [N,Az,N,N], [N,N,N,Bl]], [[N,N,N,Bl], [N,N,R,N], [Az,N,N,N], [V,N,N,N]]]

#AQUA

Y_Aq=[[N,N,N,Aq], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_Aq=[[[N,N,N,V], [N,R,N,N], [N,Az,N,N], [N,N,N,Bl]], [[N,N,N,Az], [N,N,R,N], [Bl,N,N,N], [V,N,N,N]]]

#FUCSIA

Y_F=[[N,N,N,F], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_F=[[[N,N,N,Az], [N,N,N,R], [N,N,N,V], [N,N,N,Bl]], [[N,N,N,R], [V,N,N,N], [Bl,N,N,N], [N,N,Az,N]]]

#AMARILLO

Y_Am=[[N,N,N,Am], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_Am=[[[N,N,N,R], [N,V,N,N], [N,N,N,Bl], [N,N,N,Az]], [[N,N,N,V], [N,N,R,N], [Az,N,N,N], [N,N,Bl,N]]]

#BLANCO

Y_Bl=[[N,N,N,Bl], [N,N,N,N], [N,N,N,N], [N,N,N,N]]

C_Bl=[[[N,N,N,Bl], [N,N,N,R], [N,N,N,V], [N,Az,N,N]], [[N,N,N,Bl], [N,N,R,N], [Az,N,N,N], [V,N,N,N]]]

Operaciones:

$x \wedge N = N$

$x \wedge Bl = x$

$V \wedge Az = Aq$

$R \wedge Az = F$

$R \wedge V = Am$

Algebra de Brauer:

$\Gamma_0 = \{N, Bl, R, Az, V, Aq, F, Am\}$

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$$\begin{aligned}\omega(N) &= \{N N N N N N N N N N N N N N N N\}, \\ \omega(BI) &= \{B N N N N N N N N N N N N N N N\}, \\ \omega(R) &= \{R N N N N N N N N N N N N N N N\}, \\ \omega(Az) &= \{A z N N N N N N N N N N N N N N N\}, \\ \omega(V) &= \{V N N N N N N N N N N N N N N N\}, \\ \omega(Aq) &= \{A q N N N N N N N N N N N N N N N\}, \\ \omega(F) &= \{F N N N N N N N N N N N N N N N\}, \\ \omega(Am) &= \{A m N N N N N N N N N N N N N N N\}\end{aligned}$$

$$u(\alpha) = 1, \text{ For all } \alpha \in \Gamma$$

$$S_{Bl} = \{BL^{(1)} : BL < Bl, \text{val}(Bl) = 1\}.$$

$$S_R = \{R^{(1)}\}: R < R, \quad \text{Val}(R)=1.$$

$$S_{Az} = \{Az^{(1)}\}_{Az < Az, \text{ Val}(Az)=1}.$$

$$S_V = \{V^{(1)}\}_{:V < V}, \quad \text{Val}(v)=1.$$

$$S_{Aq} = \{Aq^{(1)}\}: Aq < Aq, \text{ Val}(Aq) = 1.$$

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$$S_F = \{F^{(1)}\}: F < F, \quad \text{Val}(F)=1.$$

$$S_{Am} = \{Am^{(1)}\}: Am < Am, \quad \text{Val}(Am)=1. \quad \}$$

Dimensión del álgebra:

$$\dim \Lambda = 2| \Gamma | + \sum \text{val}(i)(u(i)\text{val}(i) - 1)$$

$$= 2(8) + (121)(120) + 0 = 14536.$$

Centro del álgebra:

$$\dim z(\wedge^{k01}\Gamma) = 1 - |\Gamma| + |\Gamma| + \#loops + \sum u(i) - |A_\Gamma|$$

$$= 1 - 8 + 8 + 120 + 8 - 0 = 129.$$

Muestra de encriptación:

Imagen original vs normalizada



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Transparencia 1



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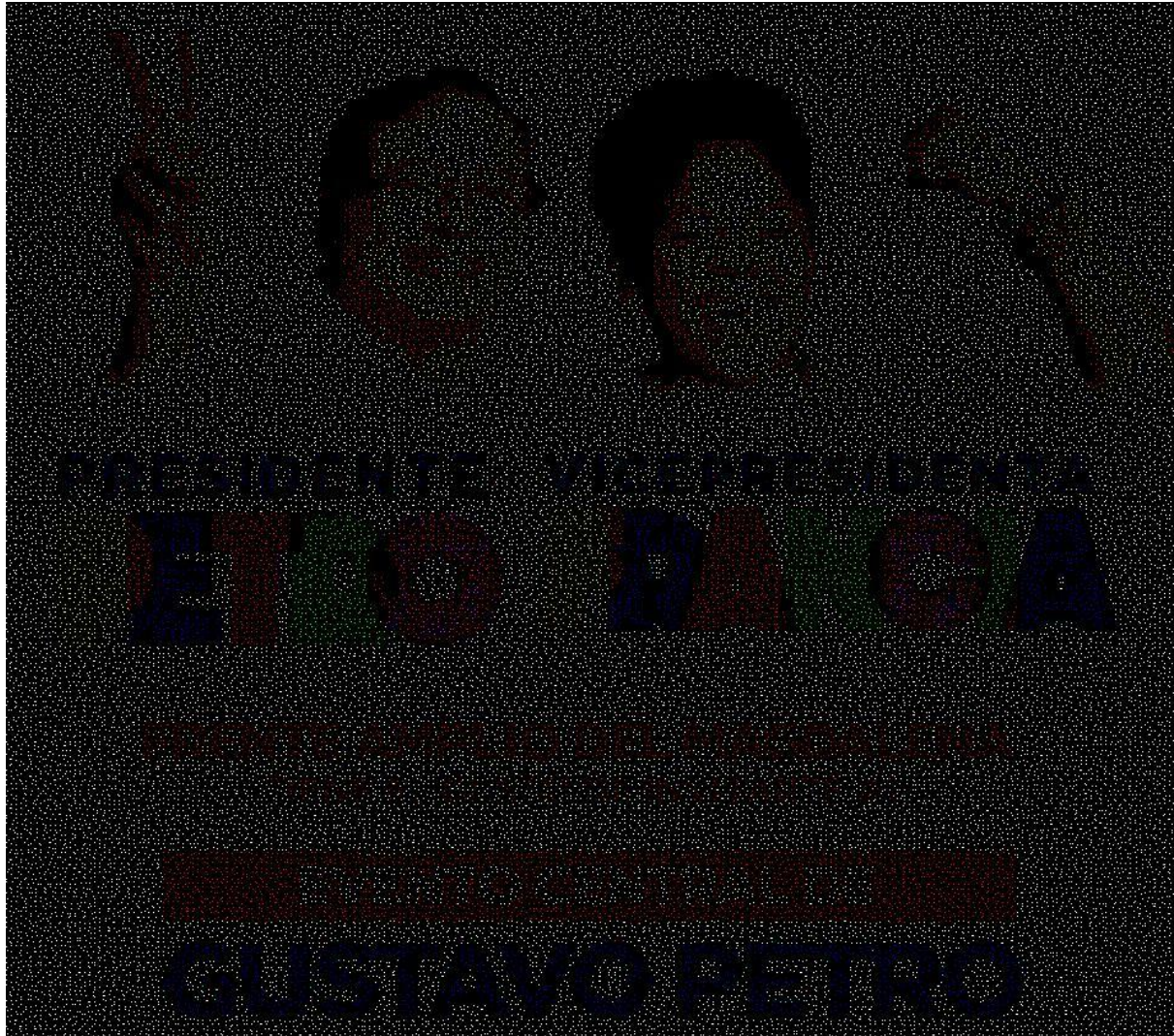
Transparencia 2



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Transparencia una y dos sobrepuestas



Nota:

La configuración de las matrices usan bastante negro, lo que produce una imagen con bastatne ruido; pero sin embargo logra el objetivo de ocultar la infromacion en las transparencia 1 y 2. Se deja esta configuración por considerarla bastante interesante.