

# Estudio sobre sistemas de anti-aliasing e implementación de anti-aliasing temporal

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U-Tad - Máster Universitario en Computación Gráfica y Simulación

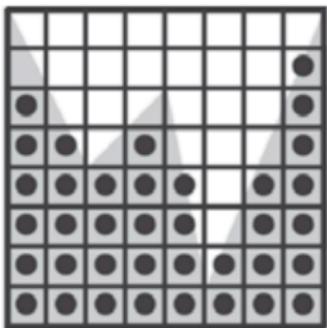
# Introducción

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# Point Sampling



(A)



(B)



(C)

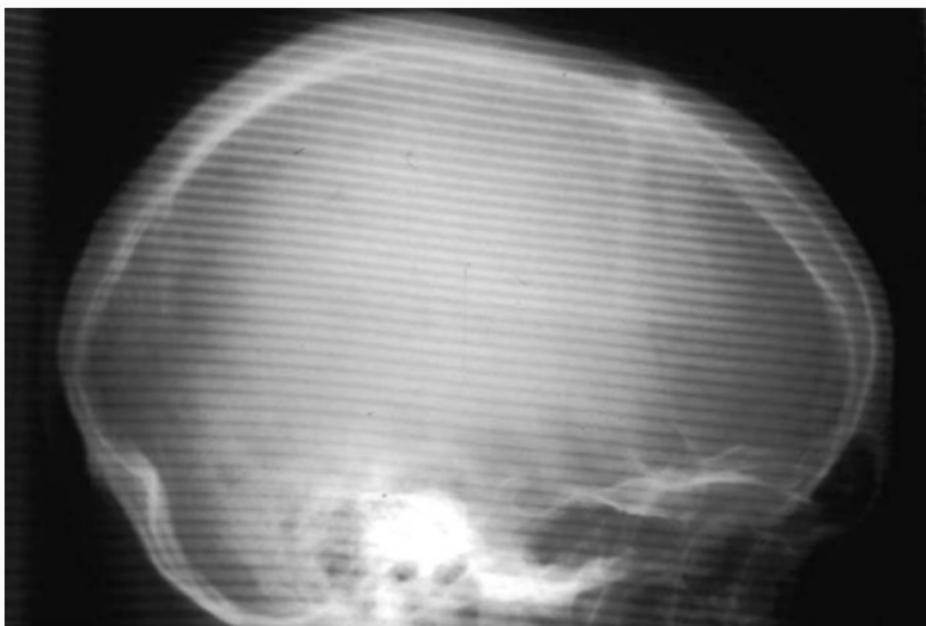
# Aliasing

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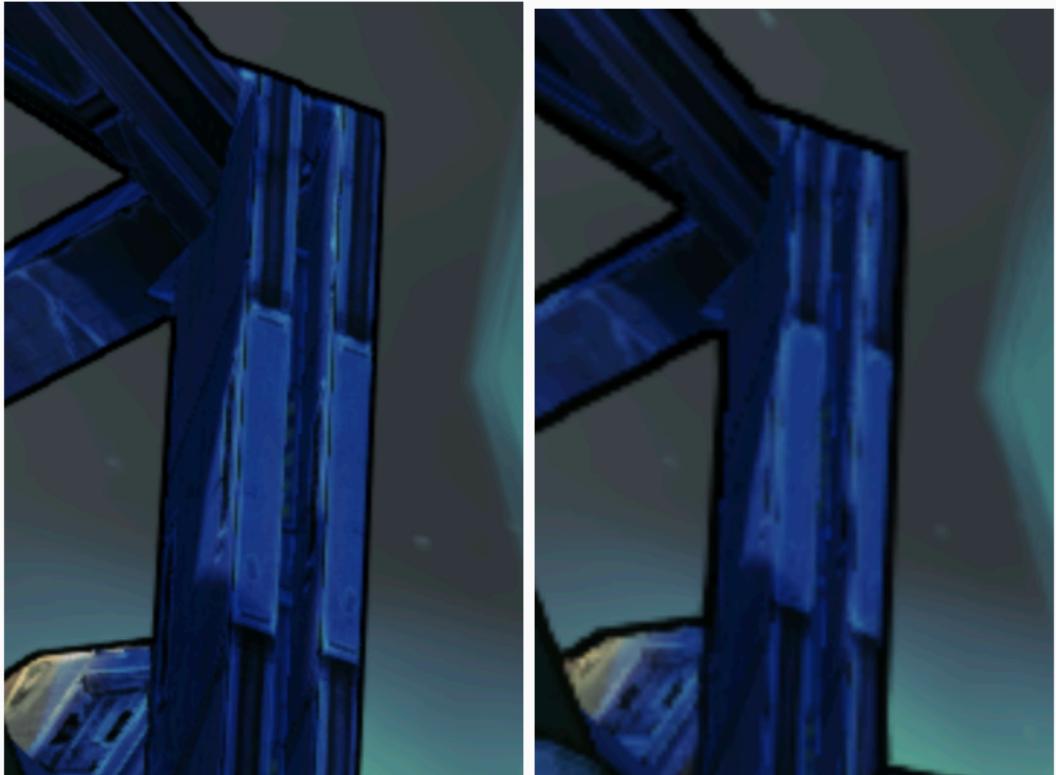
# Bordes geometría



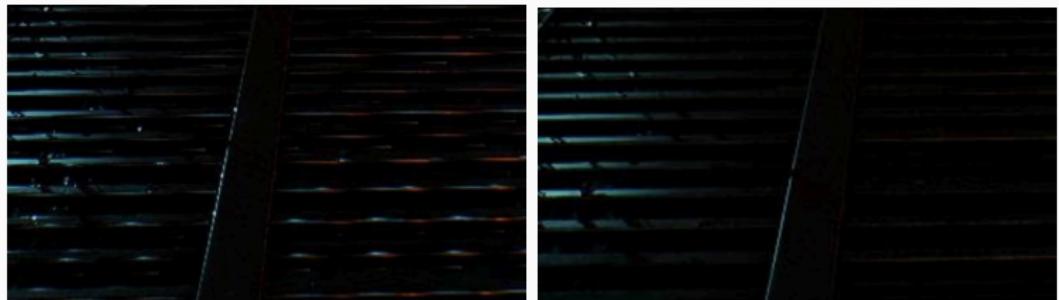
En textura



En textura



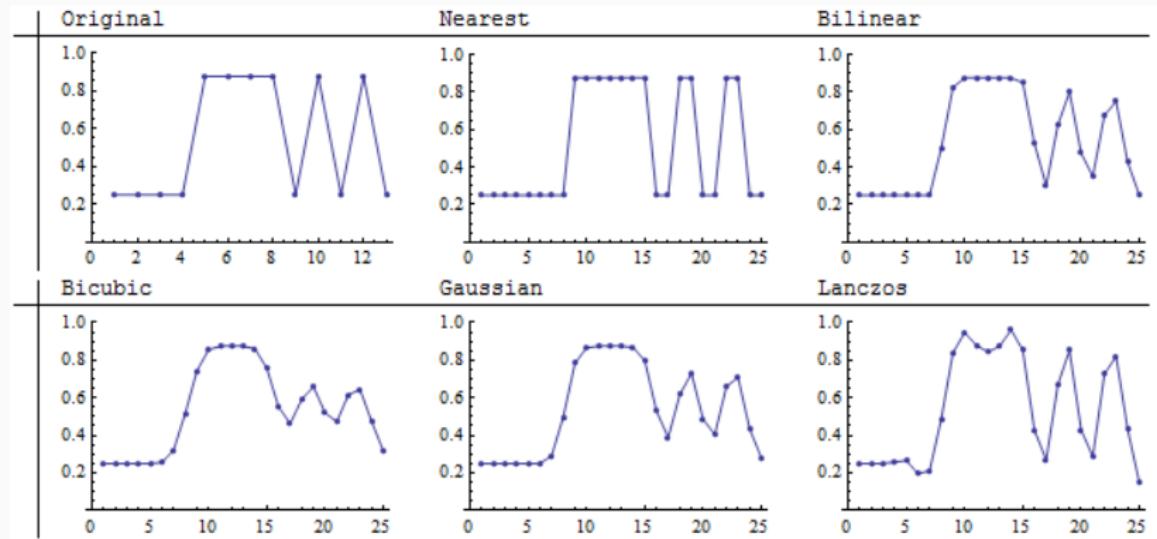
# Especular



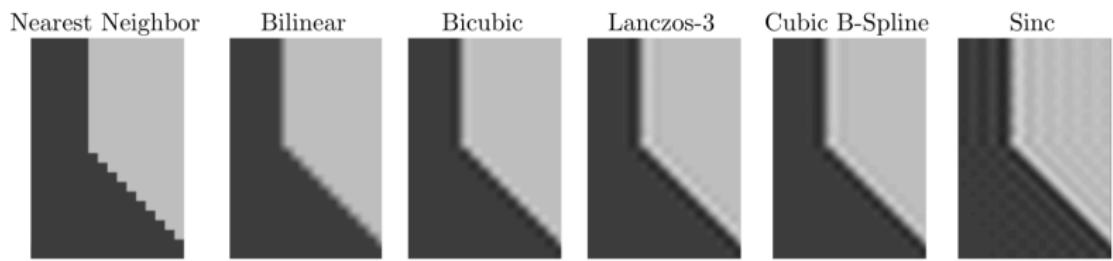
## Anti-aliasing tradicional

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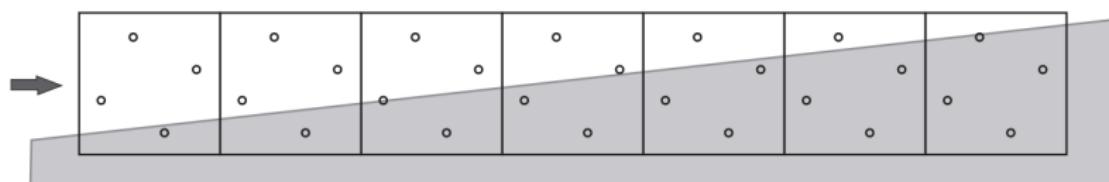
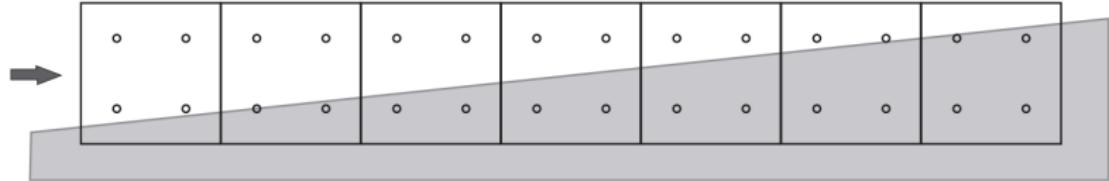
# Filtros



# Filtros

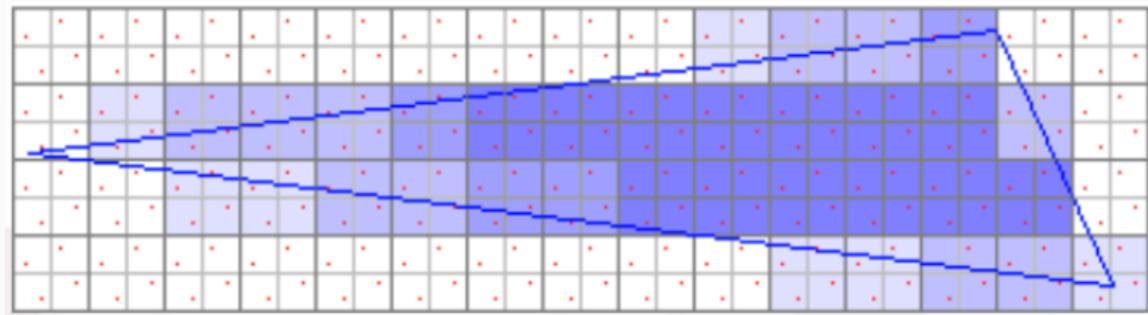


# Supersampling



# Multisampling

No funciona con deferred shading



# Post Processing AA

FXAA, MLAA, SMAA

Inyección



## Anti-aliasing temporal

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# History Buffer

Necesario guardar frame  $n-1$  para usar en shader

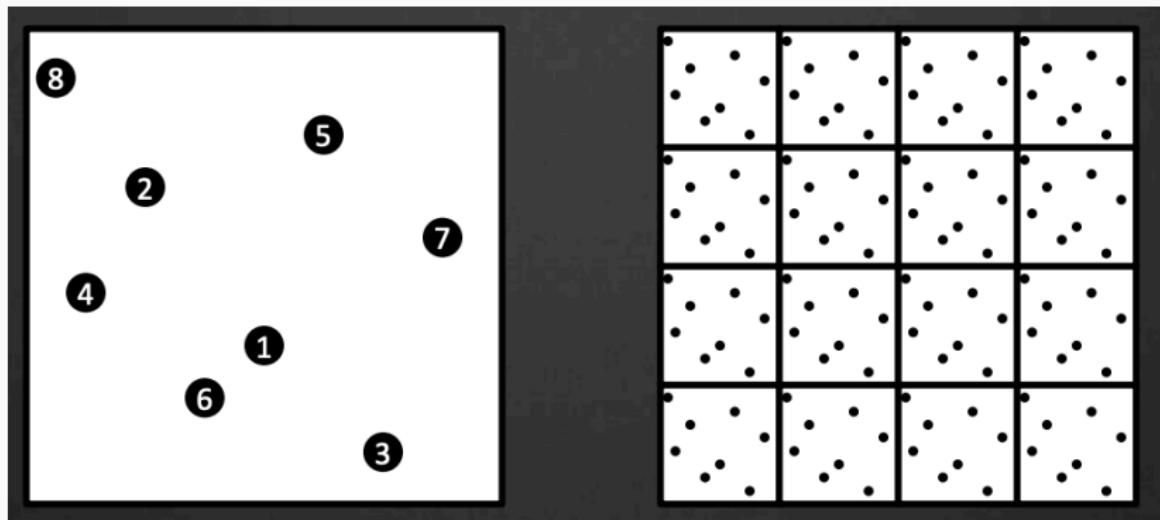


# Jitter

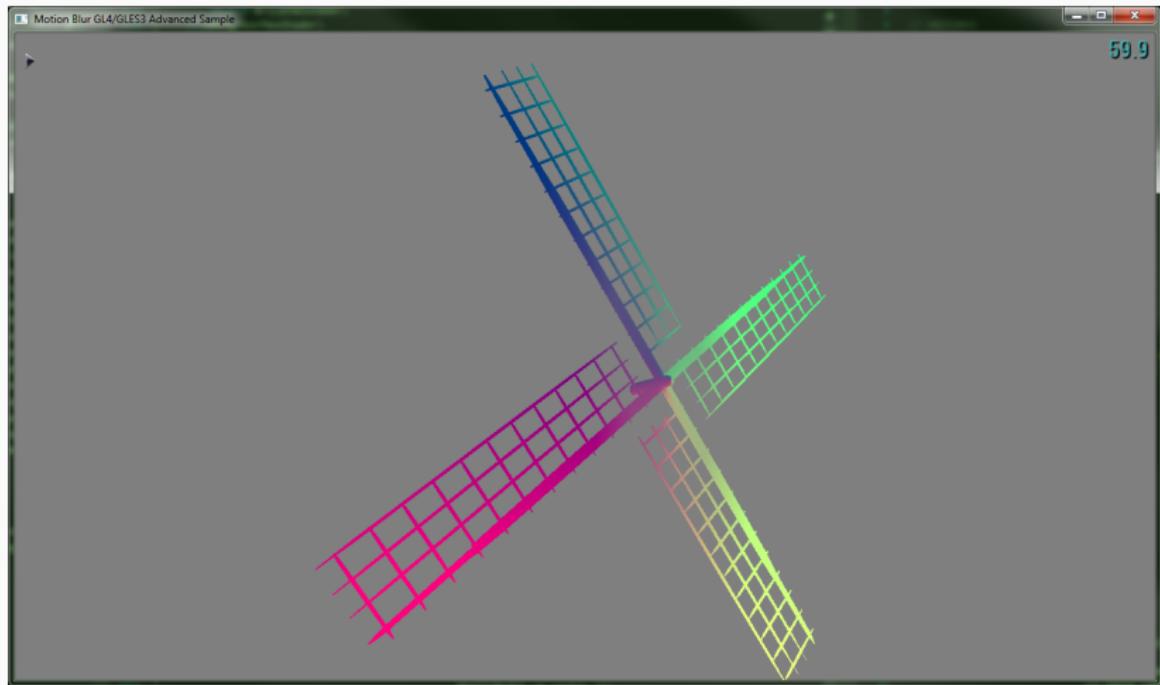
Secuencias Halton

Evita subsamples repetidos y clusters

Aplicar jitter a *MVP*

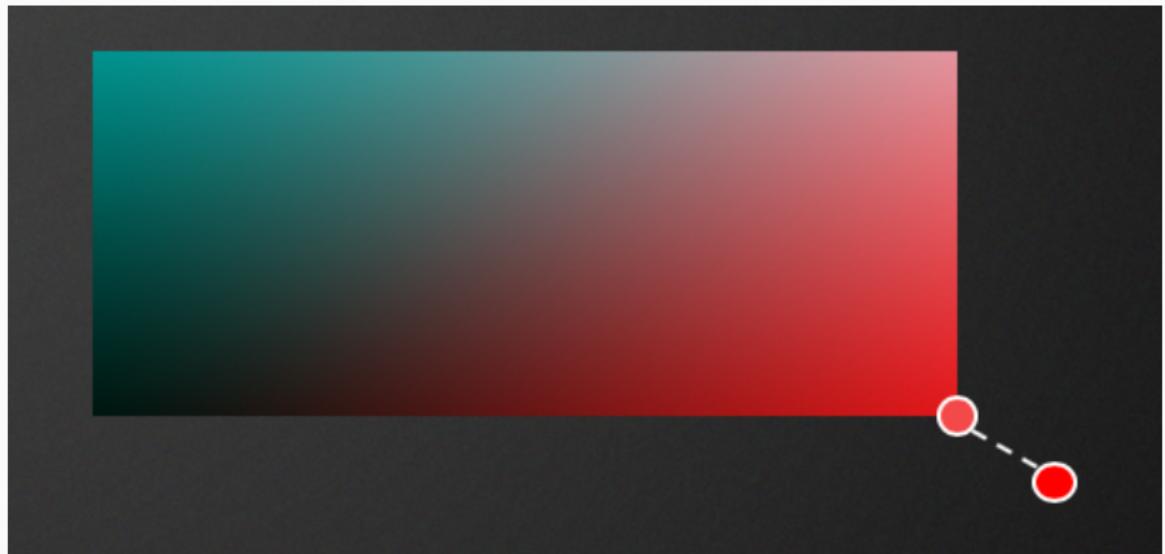


# Velocity Buffer



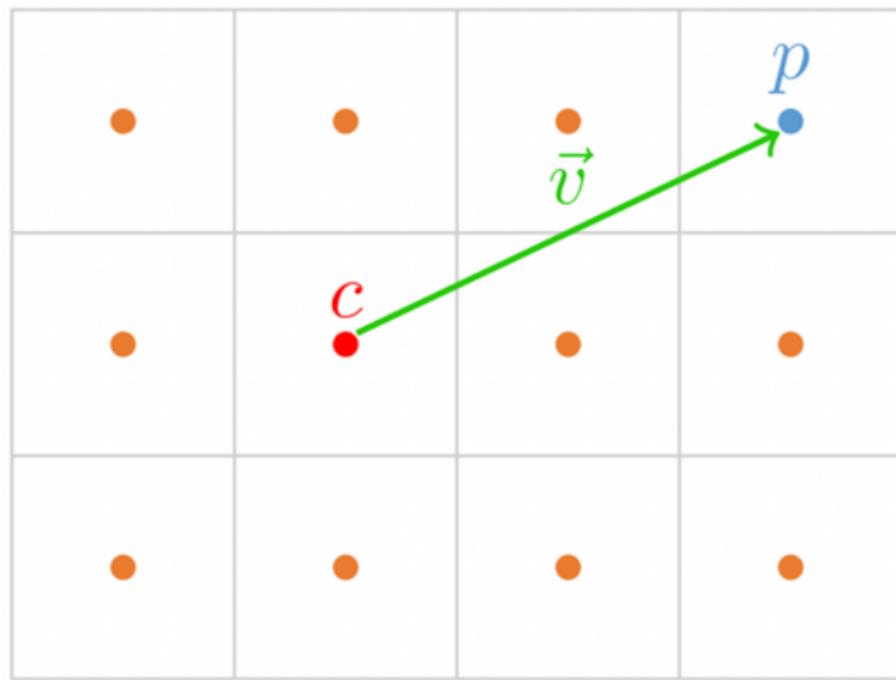
# Clamping

Mirar pixels vecinos



# Reprojection

Interpolación lineal ( 5 %)



# Sharpening

$$\begin{bmatrix} 0 & -1 & 0 \\ -1 & 5 & -1 \\ 0 & -1 & 0 \end{bmatrix}$$

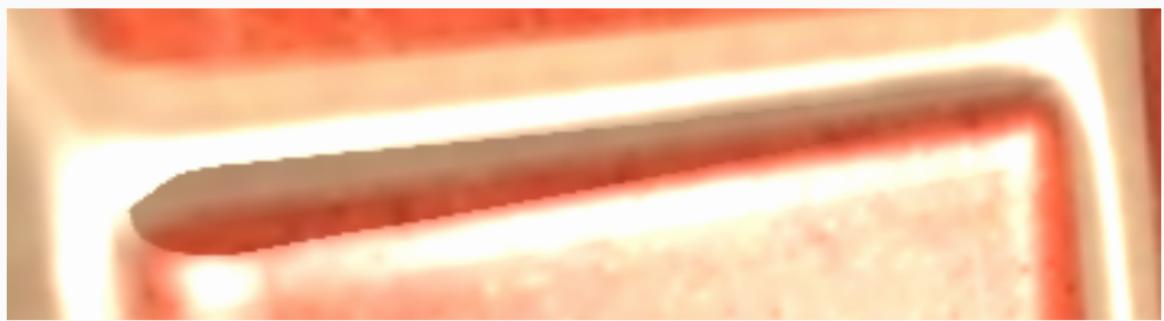
## Resultados

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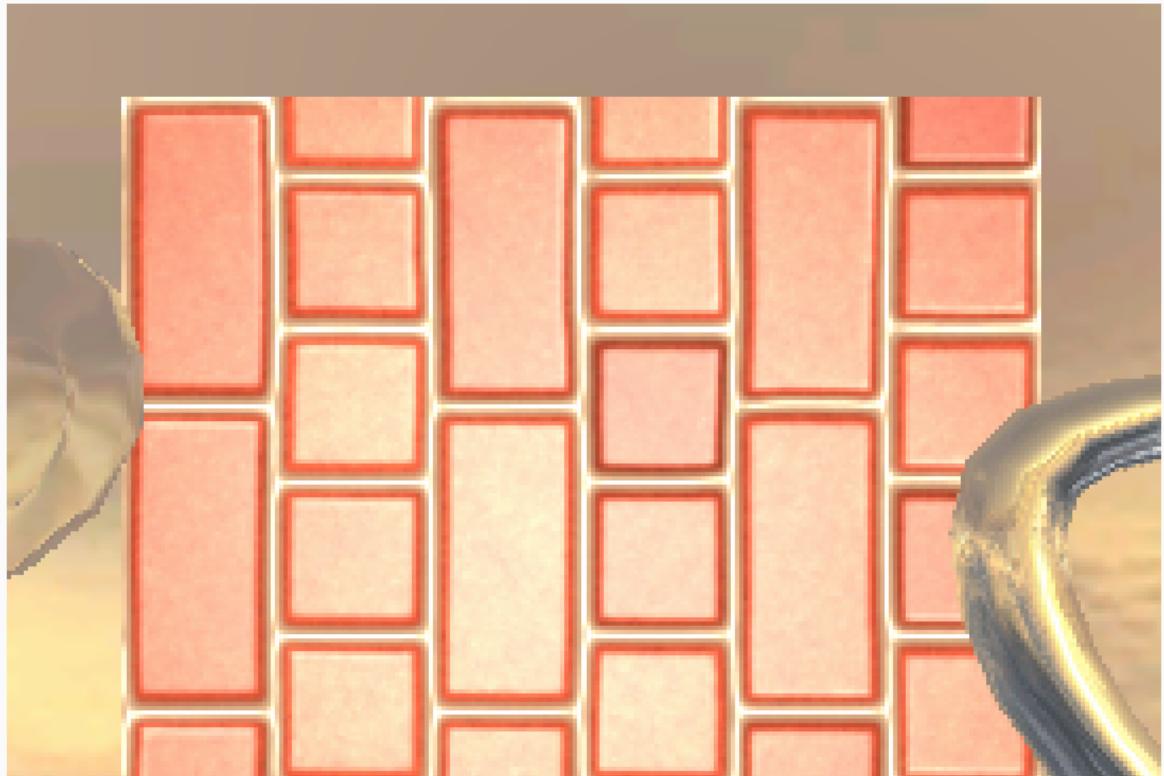
# Bordes geometría



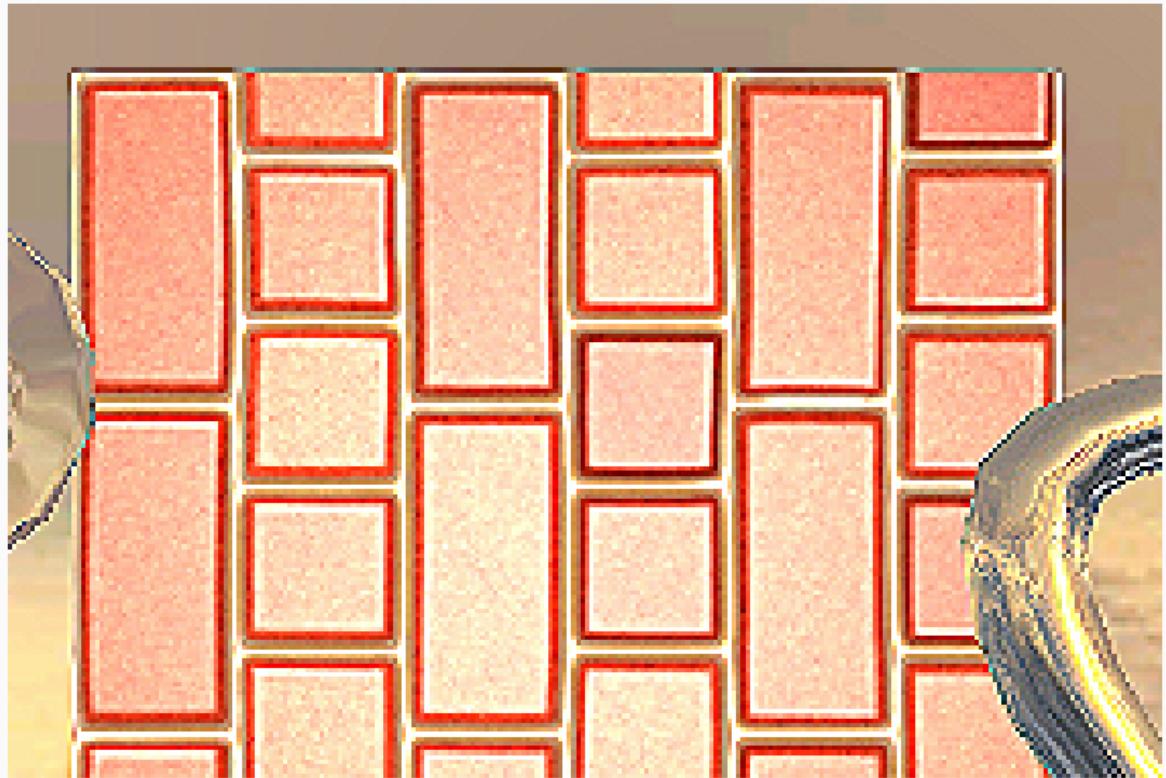
## Especular



# Sharpening



# Sharpening



## Conclusiones y mejoras futuras

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# Conclusión

Rendimiento, calidad



# Mejoras

- Blurring
- SSAO
- Transparencias
- Reflejos

# Blur



# Mejoras



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