

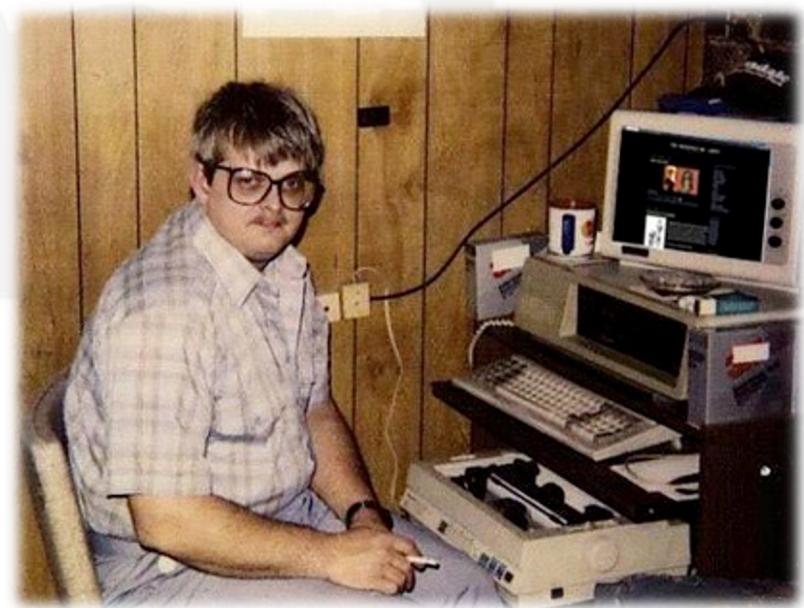
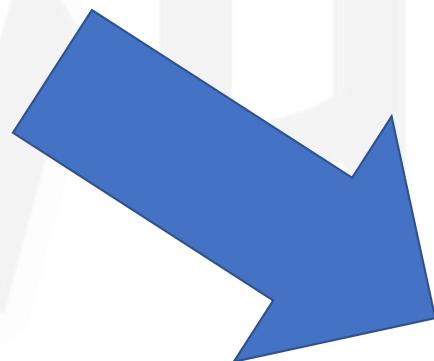


🎮 Por que estudar gráficos?

🎮 Porque é belo!



ity





 Gráficos constituem uma parte vital de Jogos Digitais Modernos.



🎮 Competição de gráficos



Can it run Crysis?





Cenário Mobile

- 🎮 Tela Reduzida
- 🎮 Menos detalhes



- 🎮 Consumo de bateria!
- 🎮 Quanto tempo dura Fortnite?





Gráficos 2D





Sprites



🎮 São imagens que representam objetos do jogo, *Game Object*





- 🎮 *GameObjects* normalmente são animados.
- 🎮 Artista desenha quadro a quadro







É responsabilidade do programador usar a sequencia correta de animação





Background



- 🎮 Representam as imagens atrás dos *Game Objects*
- 🎮 Grande responsabilidade, pois compõem o ambiente.







Tipos de Background

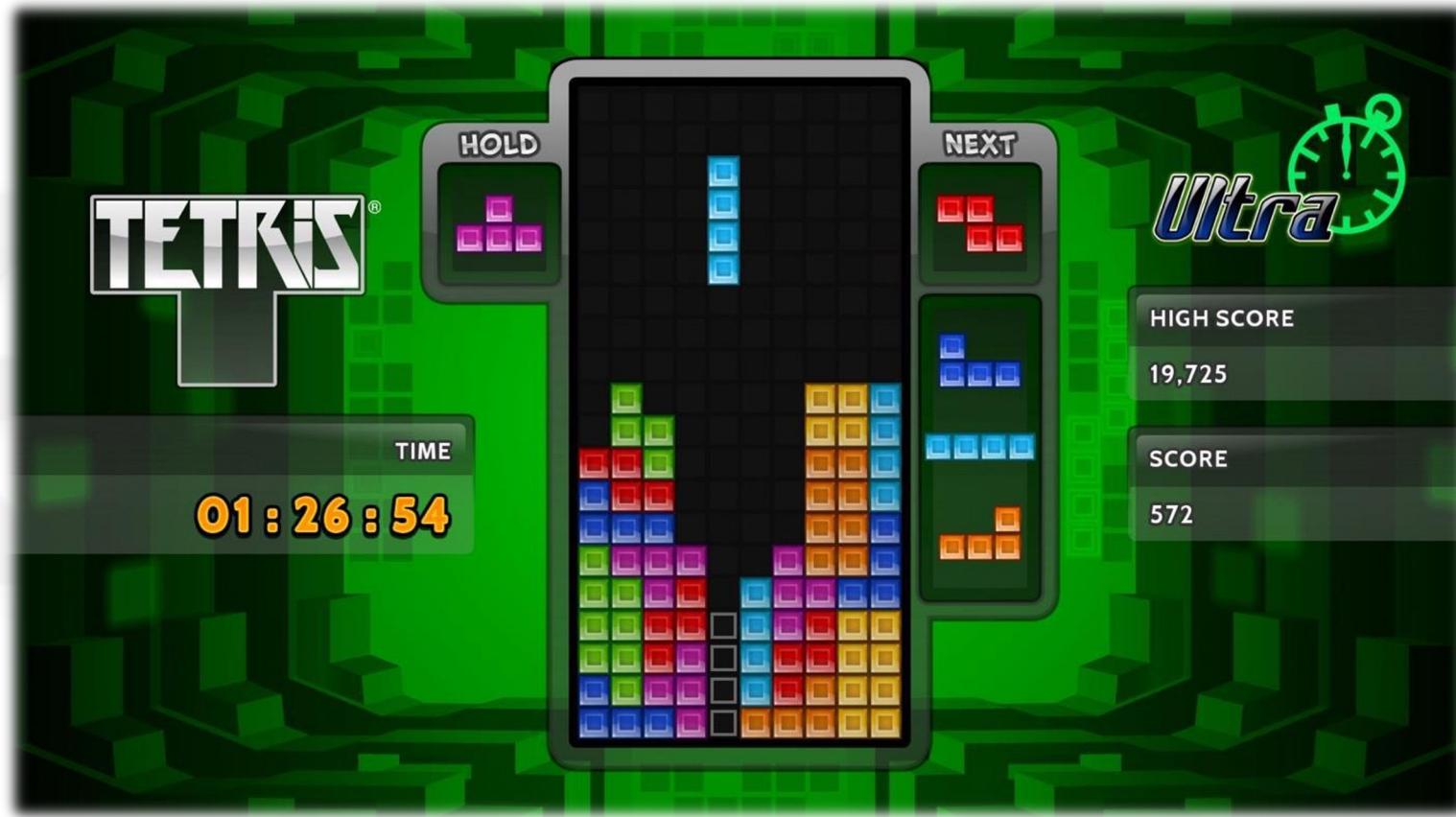




- 🎮 Usado em jogos onde a ação permanece em uma única tela
- 🎮 Ex: Tetris, Pong, PacMan, Binding of Isacc

- 🎮 Podem existir animações
- 🎮 Cada nível pode ser um background
- 🎮 Ser fixo significa que não ocorre *scrolling*





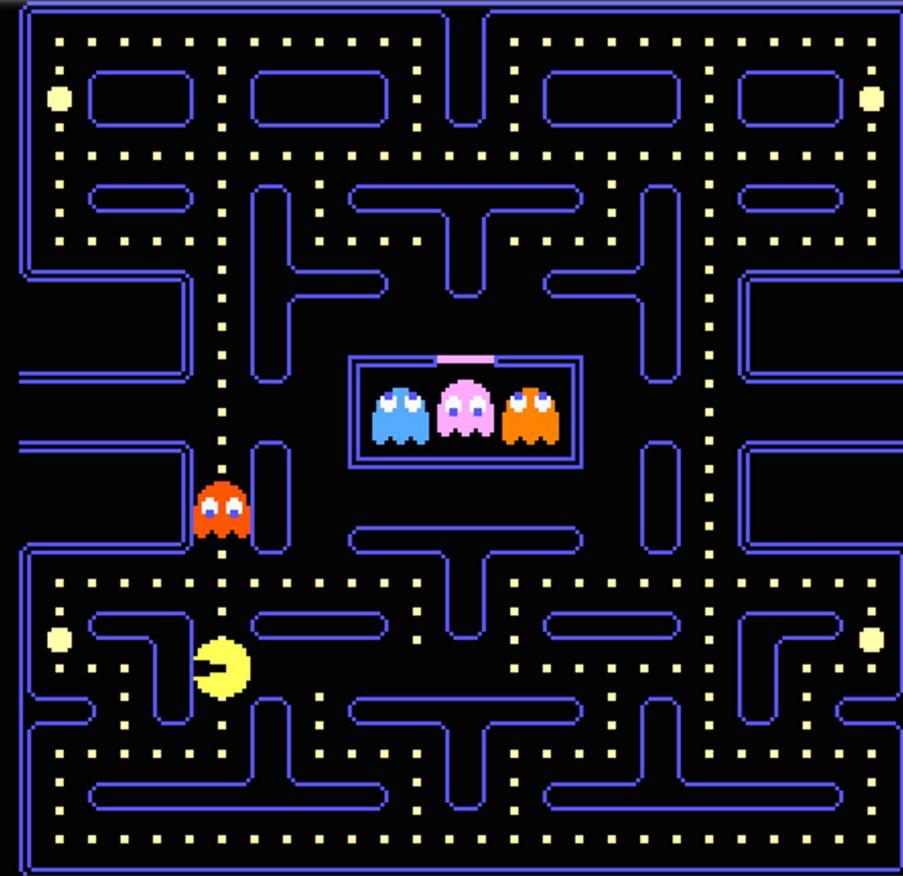


GAME
SCORE

0
0
0
7
0

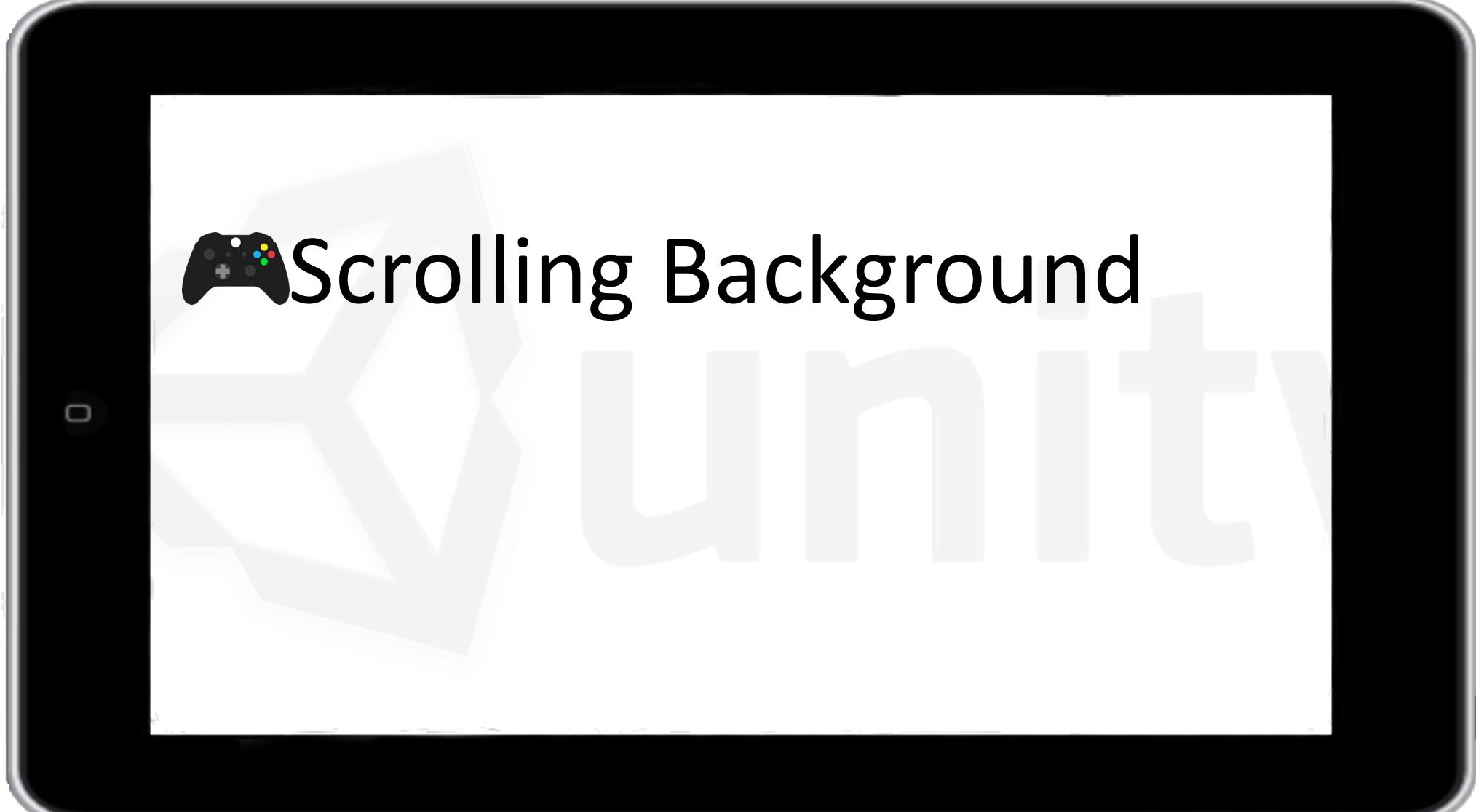
HIGH
SCORE

0
0
0
0



DOOR DOOR DOOR

1.29



 Scrolling Background

unity

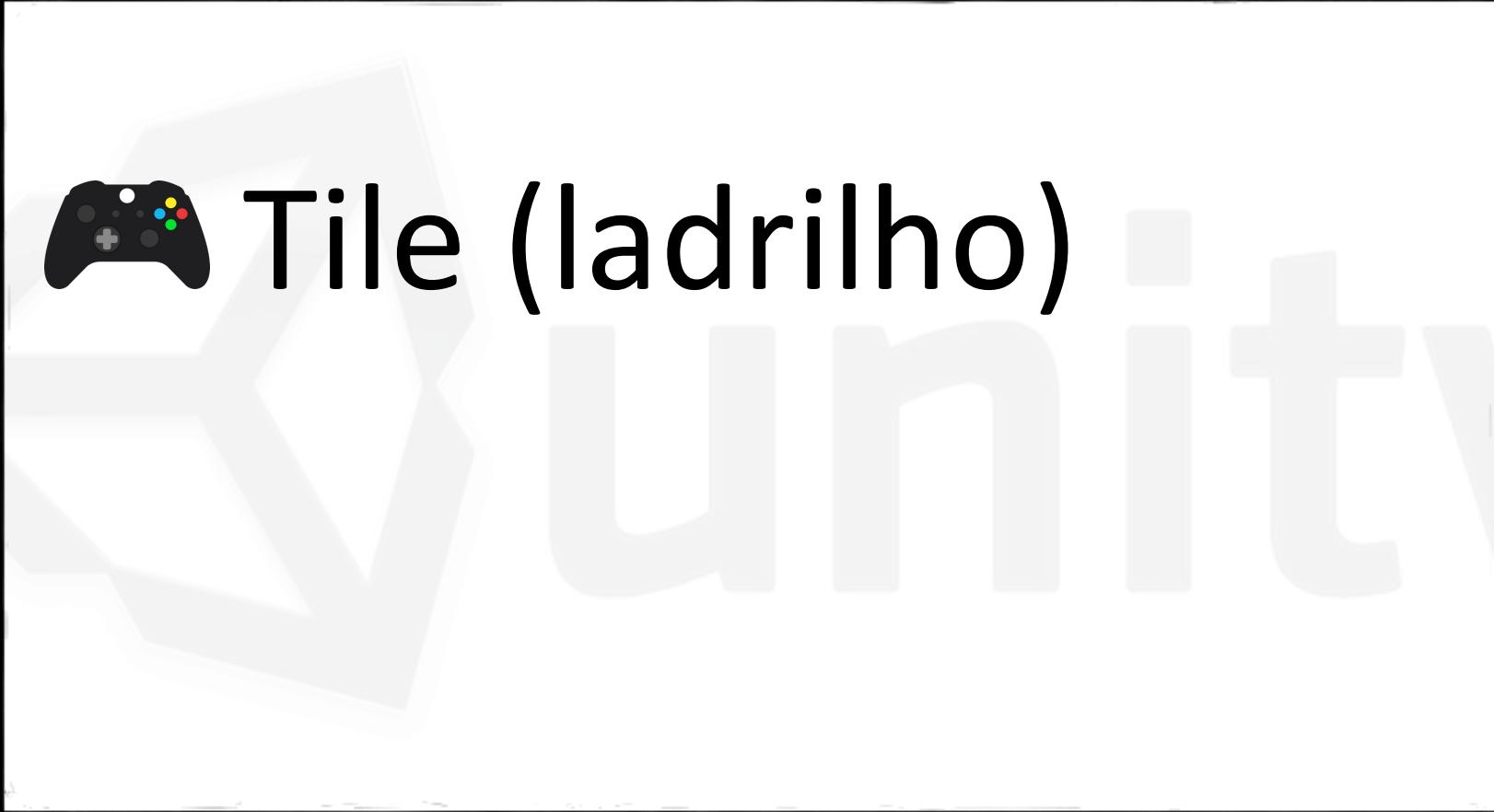
- 🎮 O cenário se move junto com o jogador
- 🎮 A tela visível representa apenas uma parte
- 🎮 O scroll pode ser horizontal ou vertical







Tile (ladrilho)





- 🎮 Construção de backgrounds vastos.
- 🎮 Uso eficiente da memória.
- 🎮 *Tile Based Games.*



Faremos esse jogo 😊





Pokemon Crystal





- 🎮 Unity apresenta o *TileMap*
(desde 2017)
- 🎮 Recurso para facilitar a
criação de backgrounds *Tile
Based*

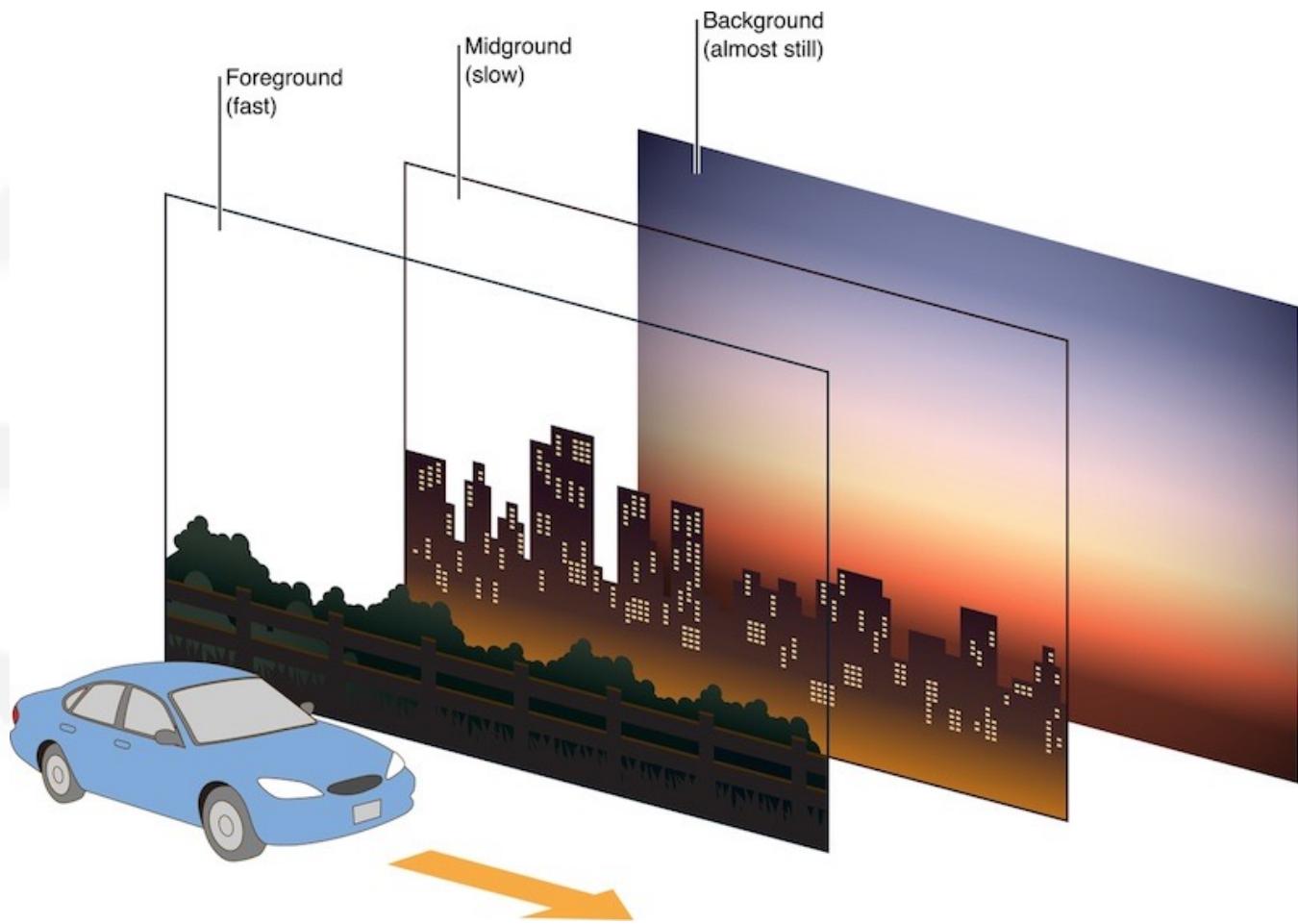


Efeito Parallax





tv





Mascaramento

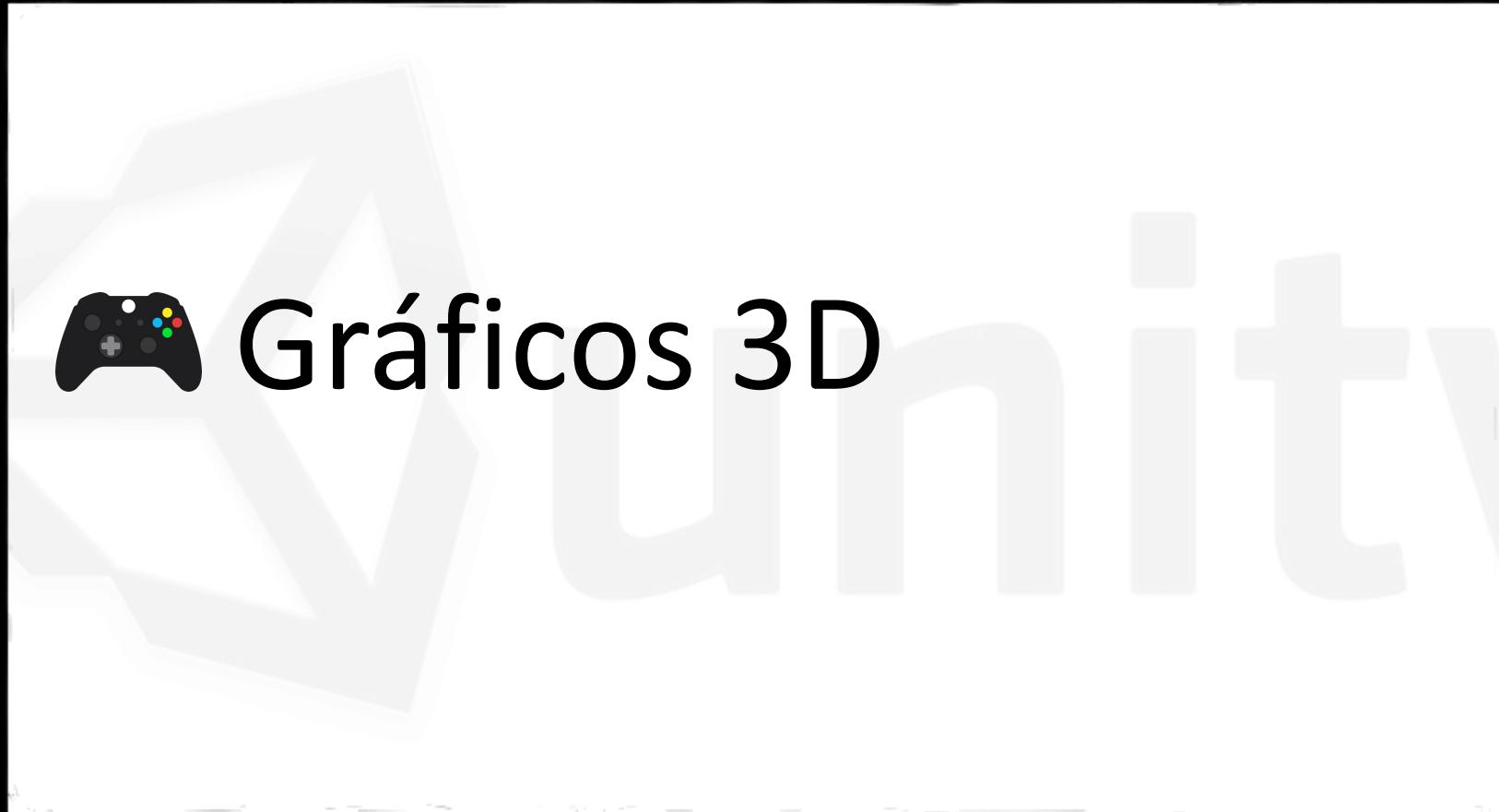


- 🎮 Técnica para controlar transparência
- 🎮 Unity permite controlar o nível de alpha





Gráficos 3D



 GPU permitiu jogos 3D nos dispositivos móveis





GPU VS CPU

	GPU	CPU
Núcleo	⬆	⬇
Freq Núcleo	⬇	⬆
Paralelização	⬆	⬇



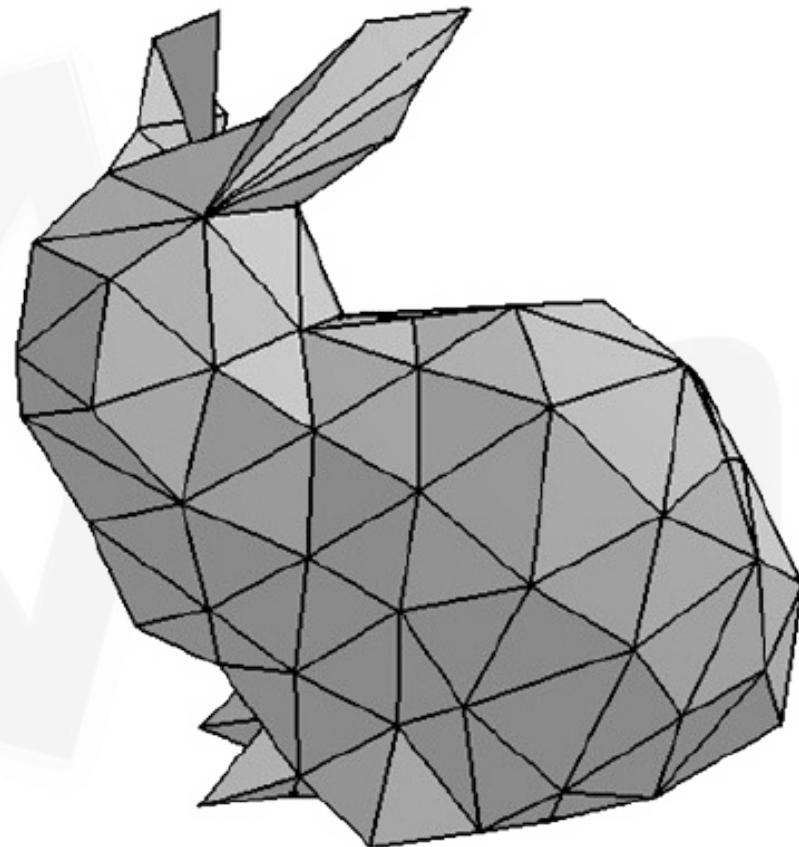
Realiza cálculos com polígonos



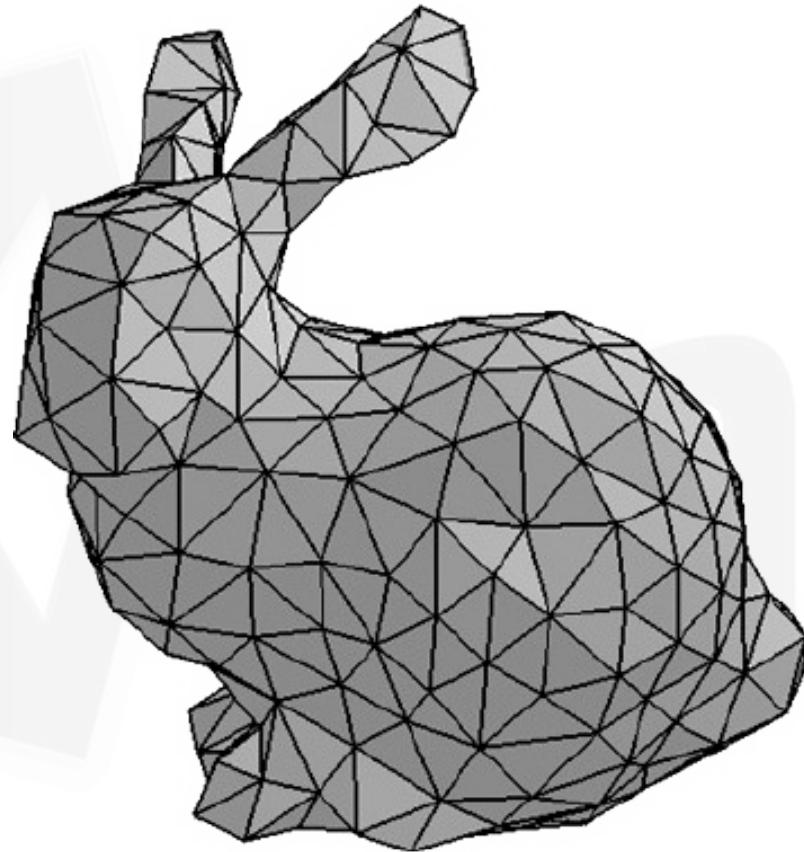
Modelo 3D



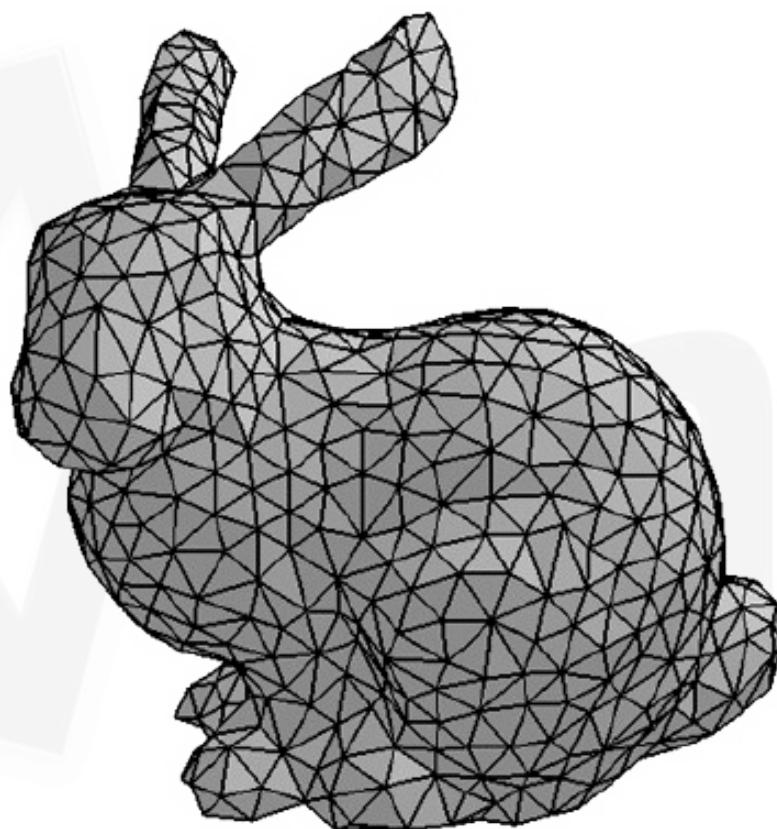
- 🎮 Malha Básica de Polígonos
- 🎮 *Polygon Mesh*
- 🎮 Idealmente triângulo ou *quad*
- 🎮 Quanto mais polígonos mais detalhes
- 🎮 Modelo criado é o *low poly*



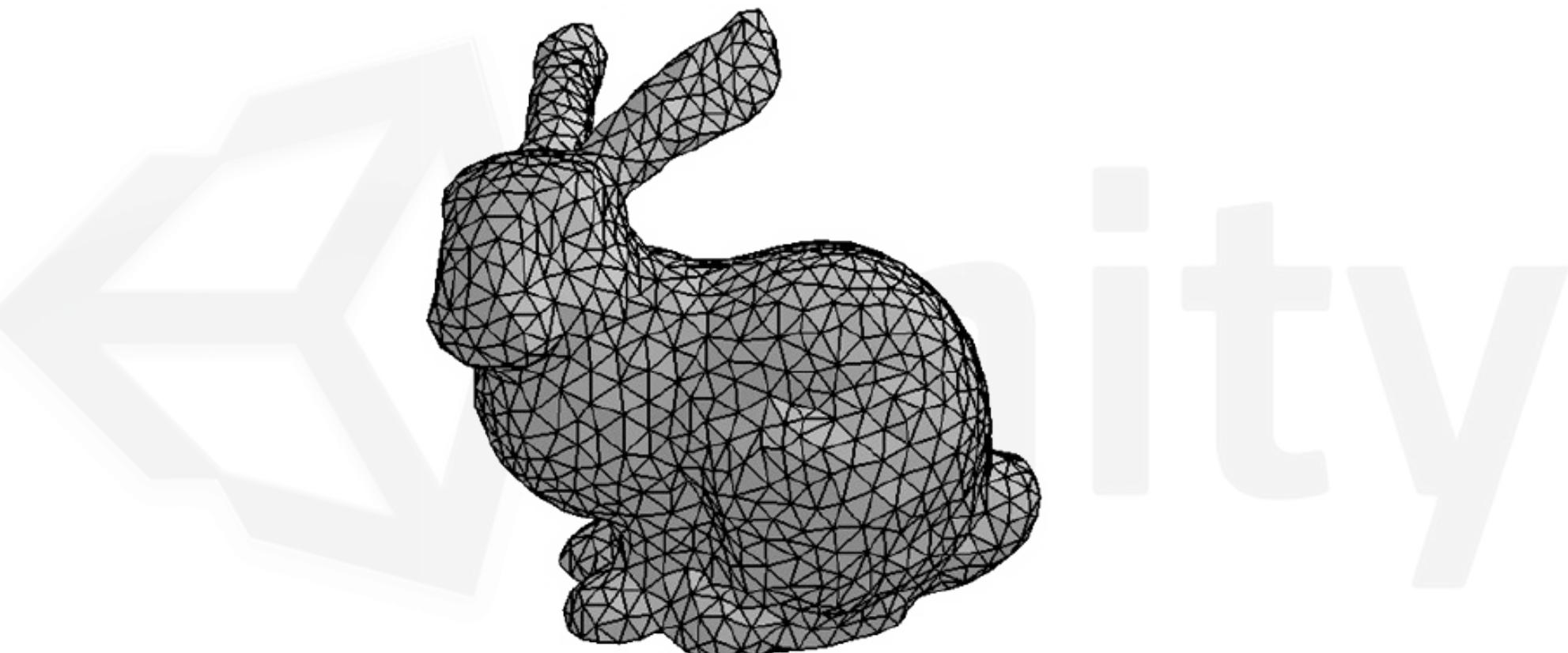
osity

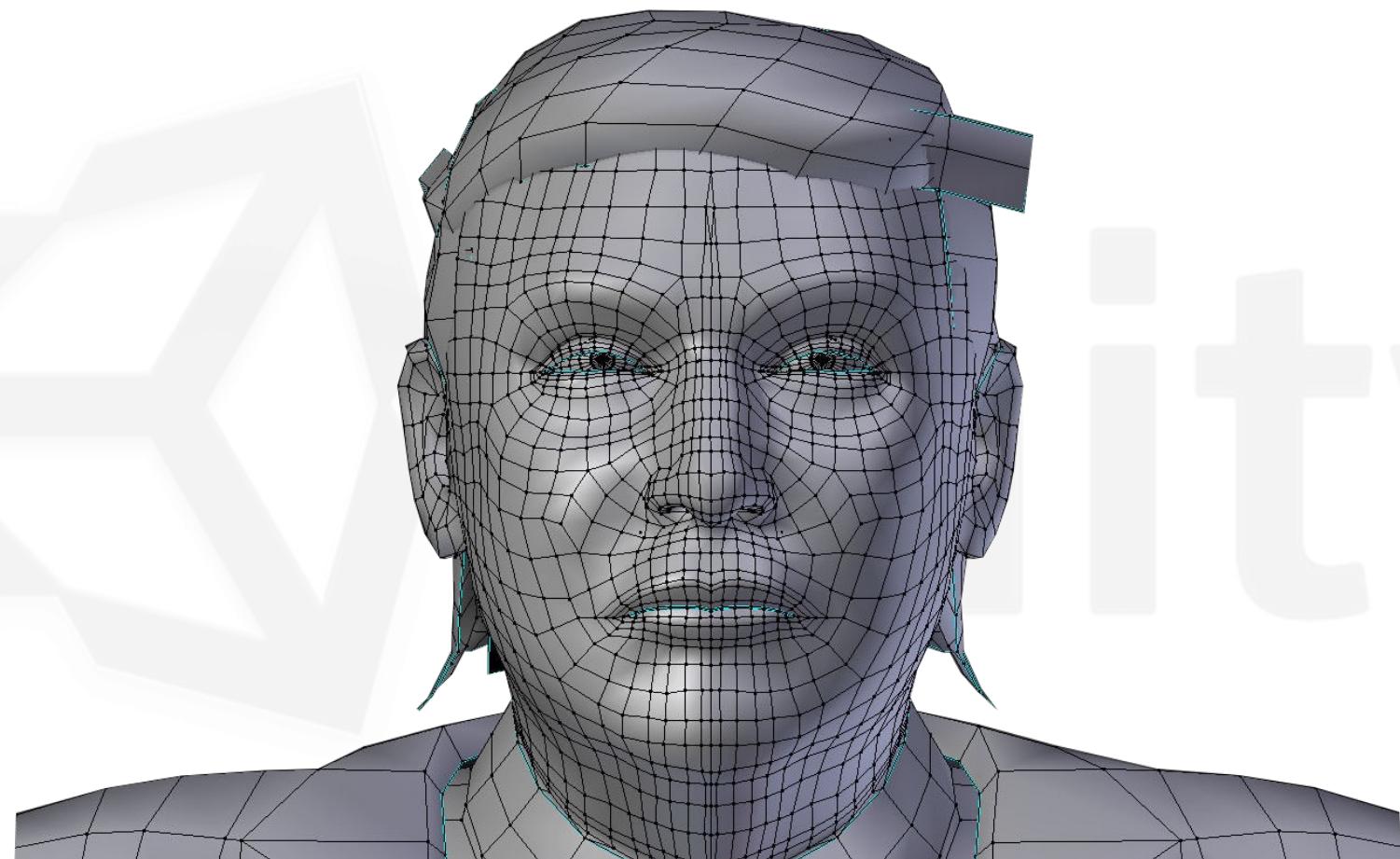


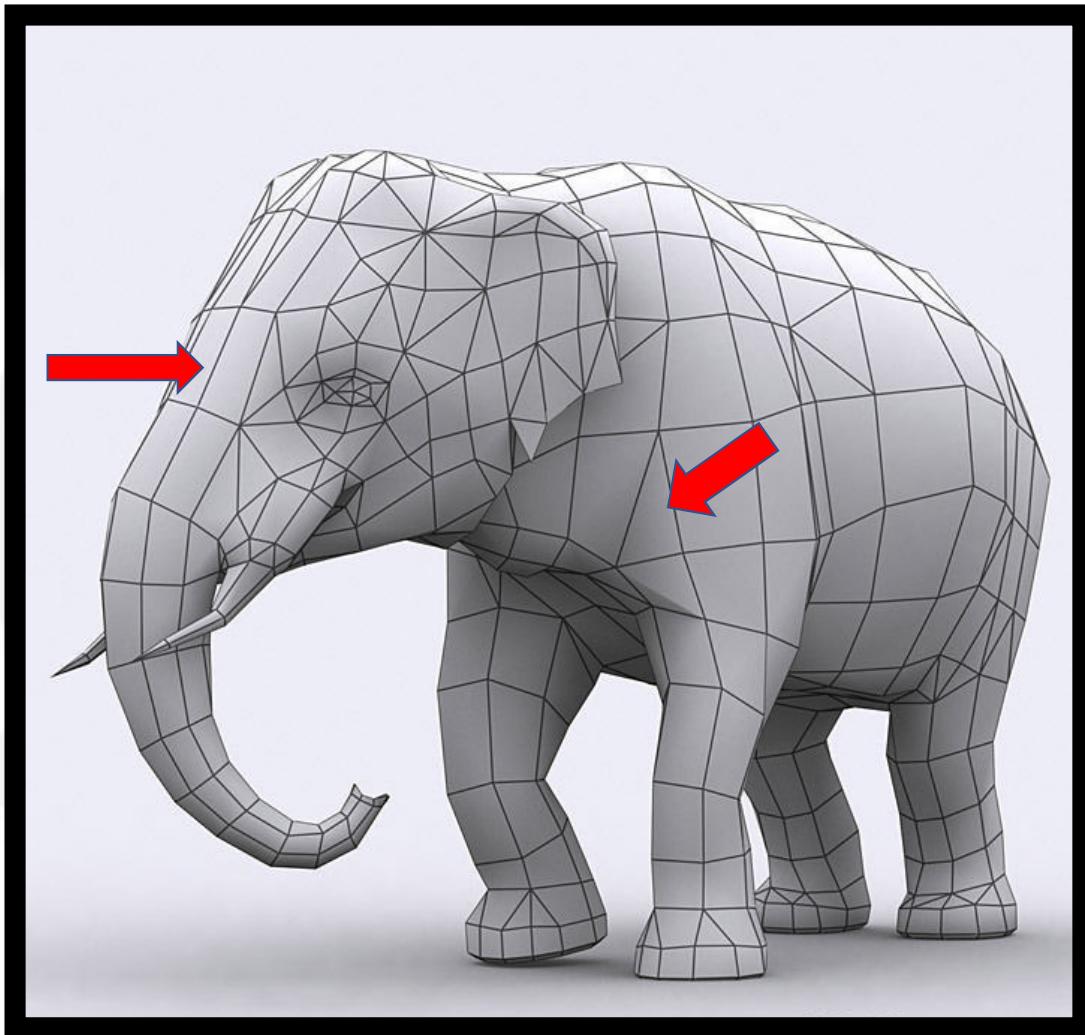
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city







- 🎮 Para a GPU tudo virá triângulo
- 🎮 Unity converte Ngon para triângulo



Onde fazer?



AUTODESK®
3DS MAX®



Esculpir





Low poly -> High Poly

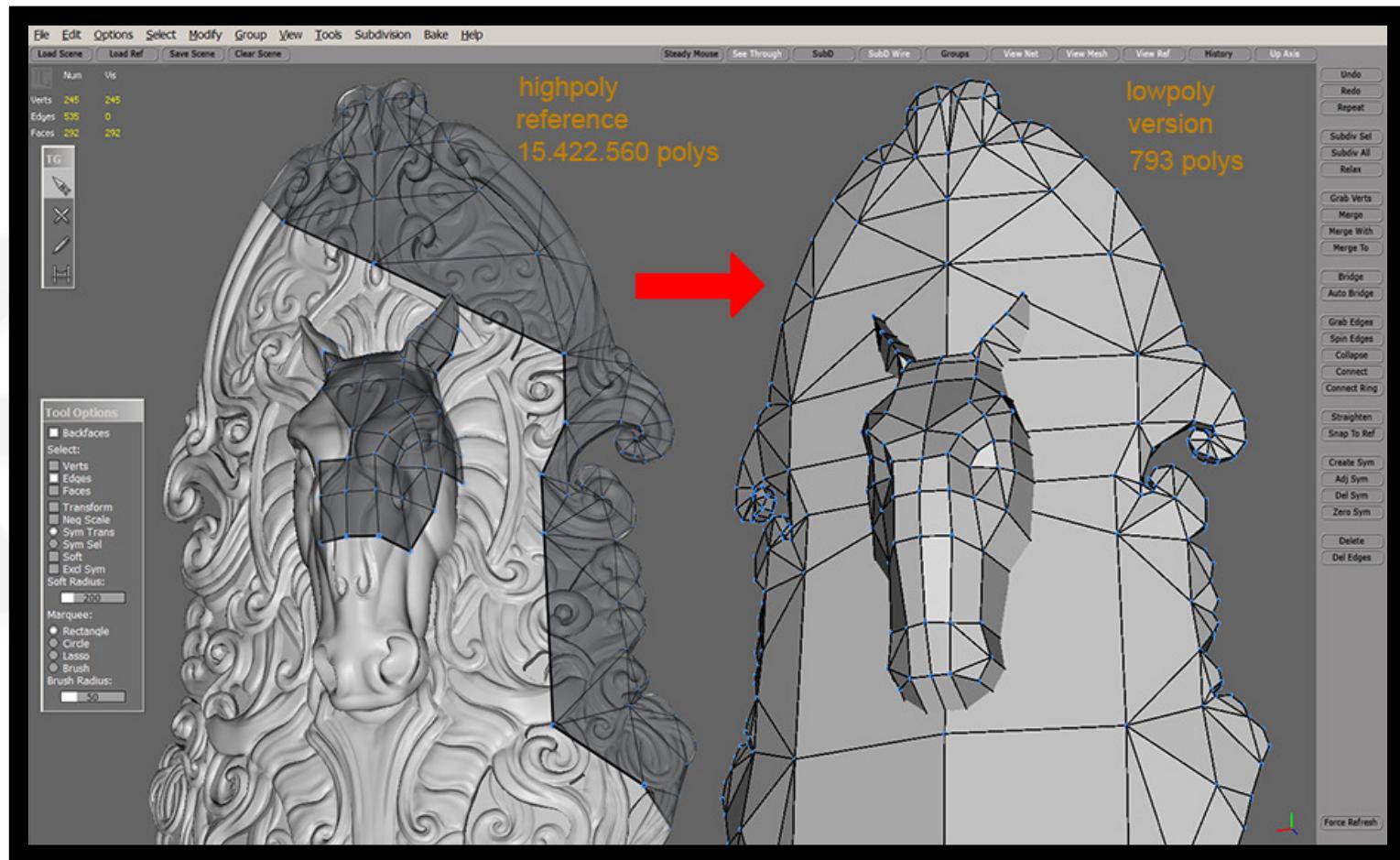


Riqueza de detalhes



CGArena

Low Poly Vs High Poly





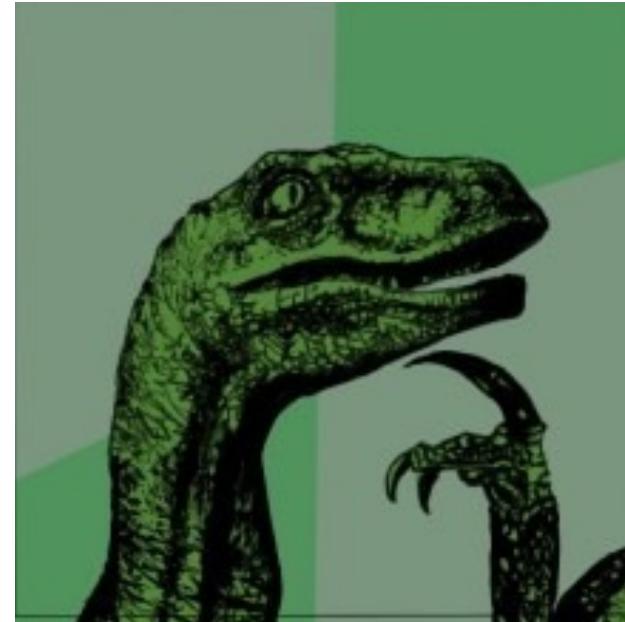
Onde esculpir?



AUTODESK®
3DS MAX®



🎮 Mais polígonos maior o gasto computacional



🎮 High poly é inviável
🎮 Low poly é



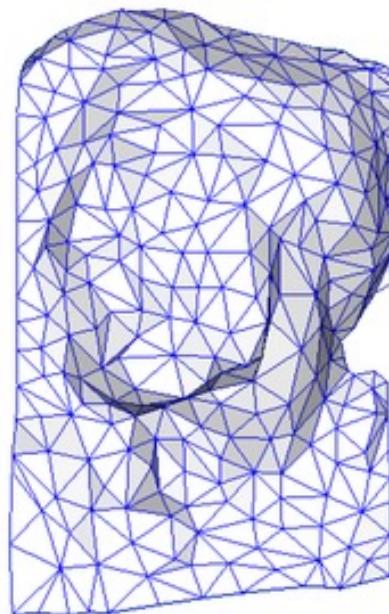


Normal Map

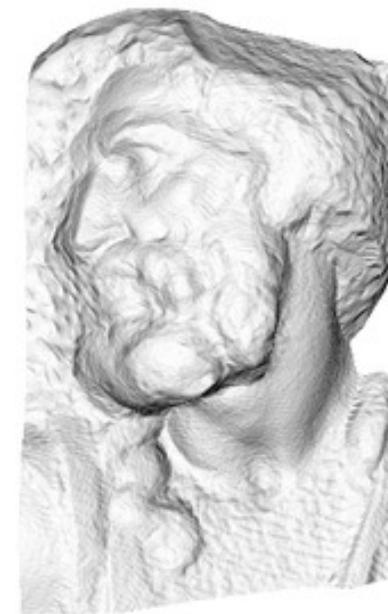




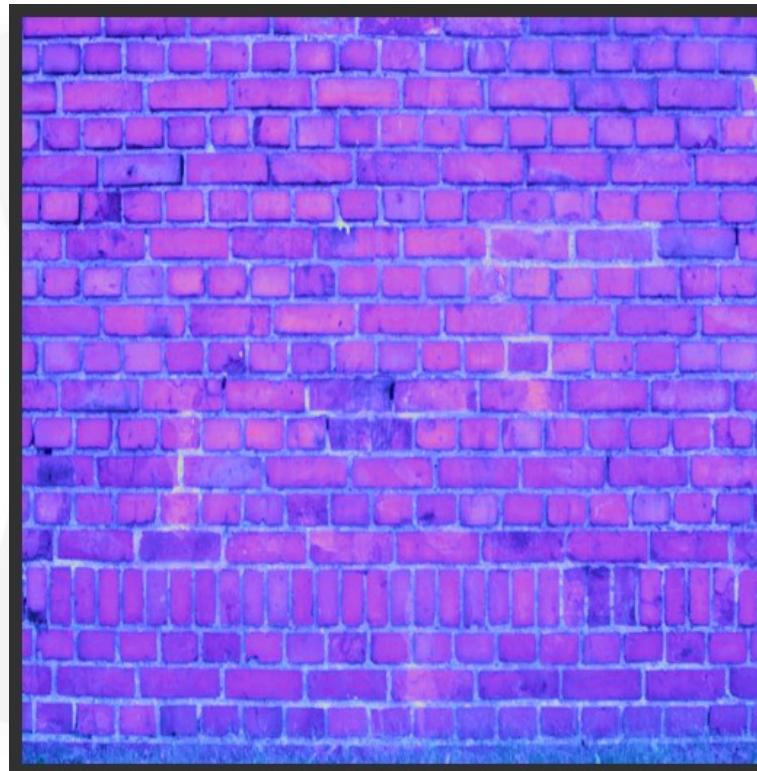
original mesh
4M triangles



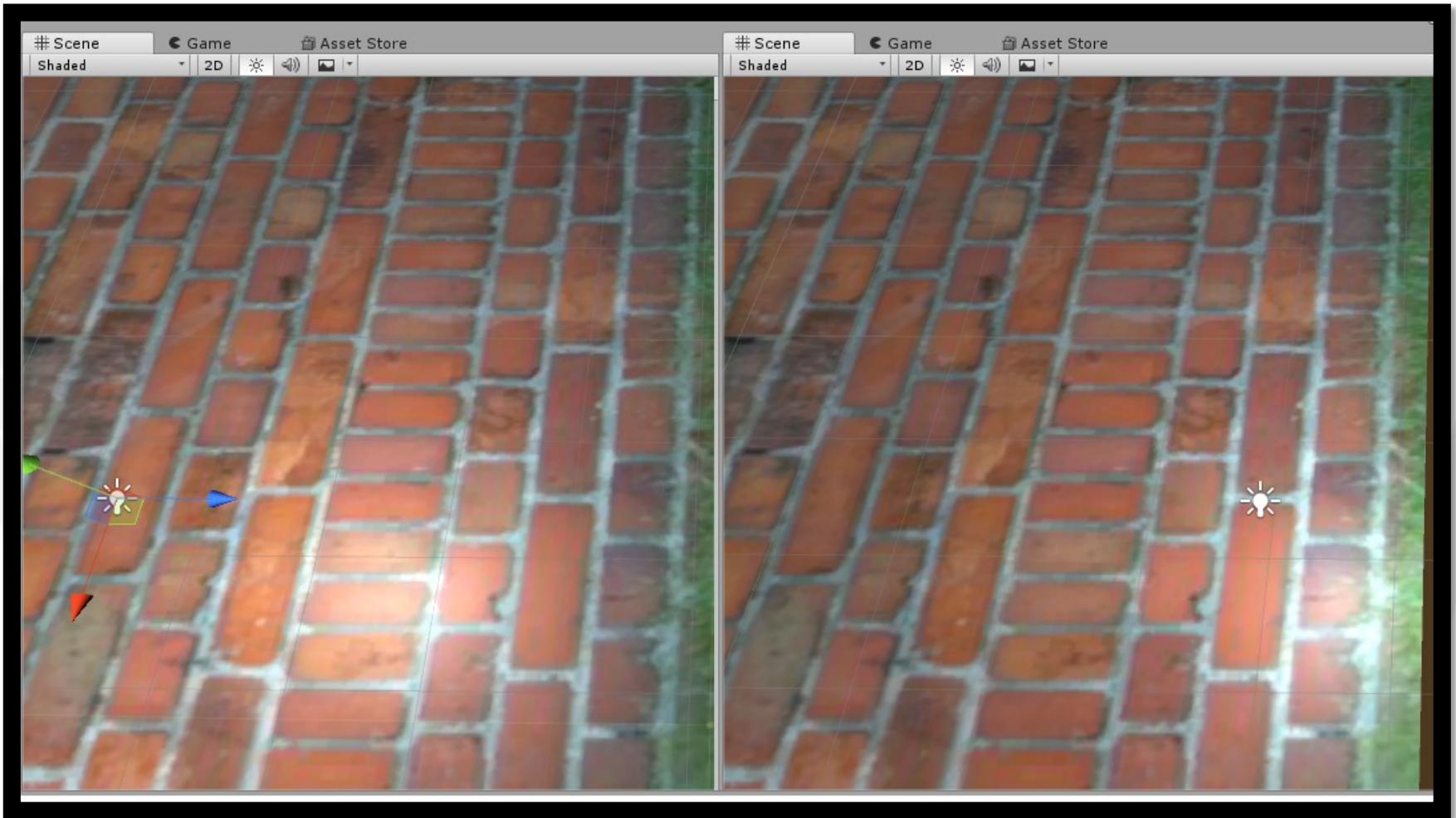
simplified mesh
500 triangles

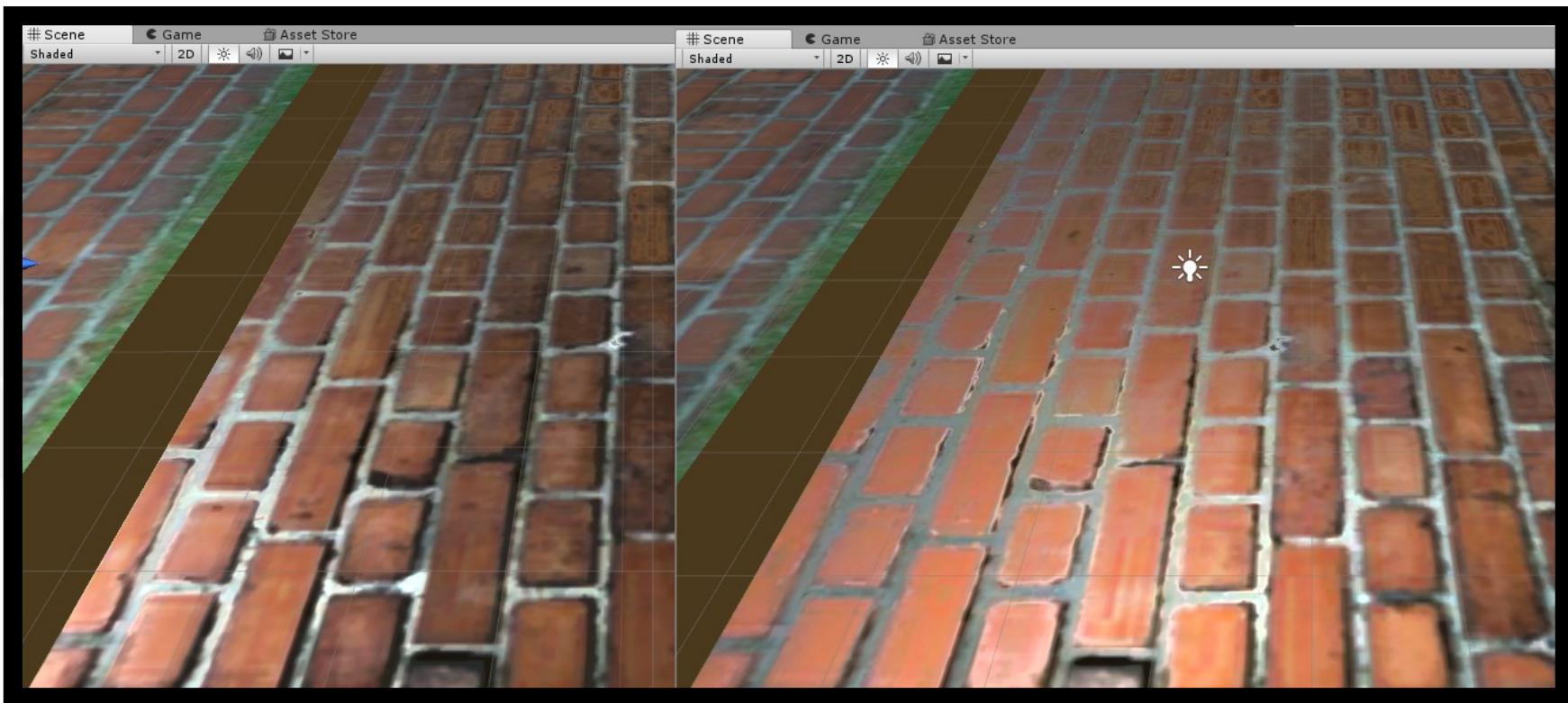


simplified mesh
and normal mapping
500 triangles



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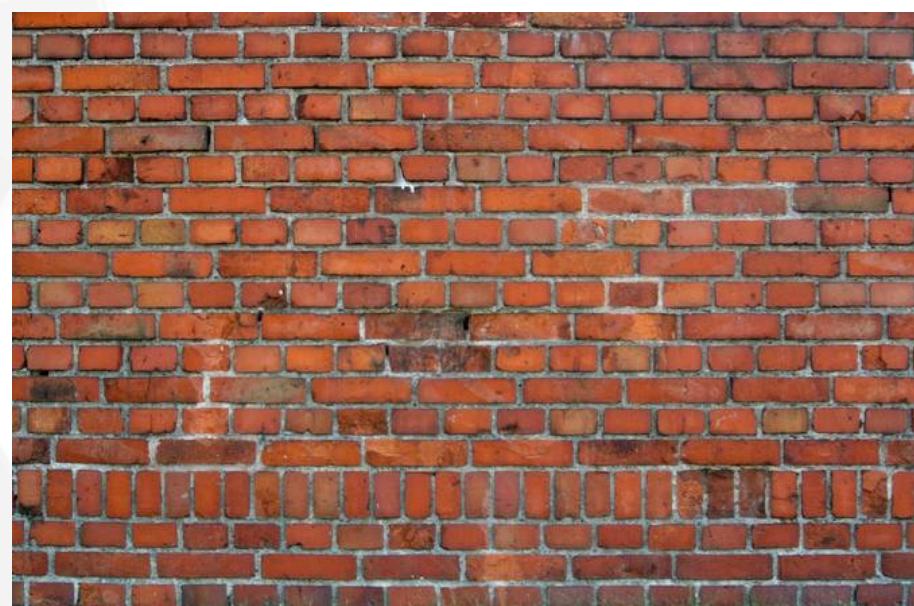




Textura

unity

- 🎮 Imagem externa!
- 🎮 Colorido direto no modelo
- 🎮 Albedo map





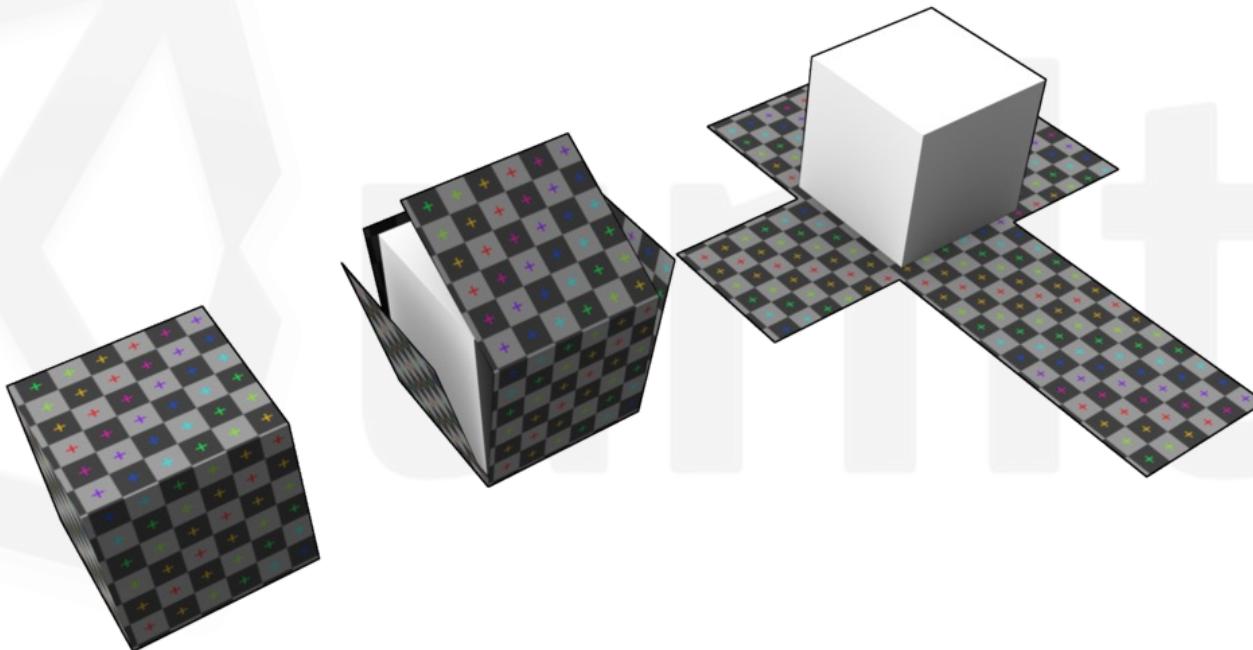


Mapeamento UV



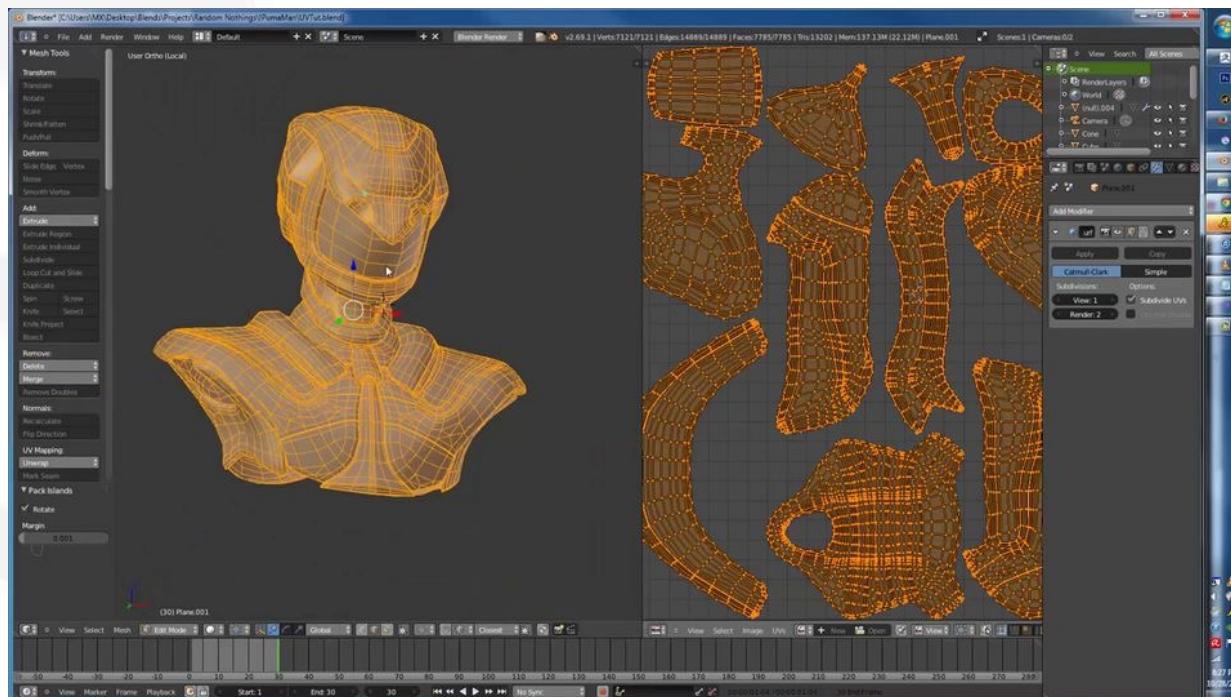


Representar o modelo no plano





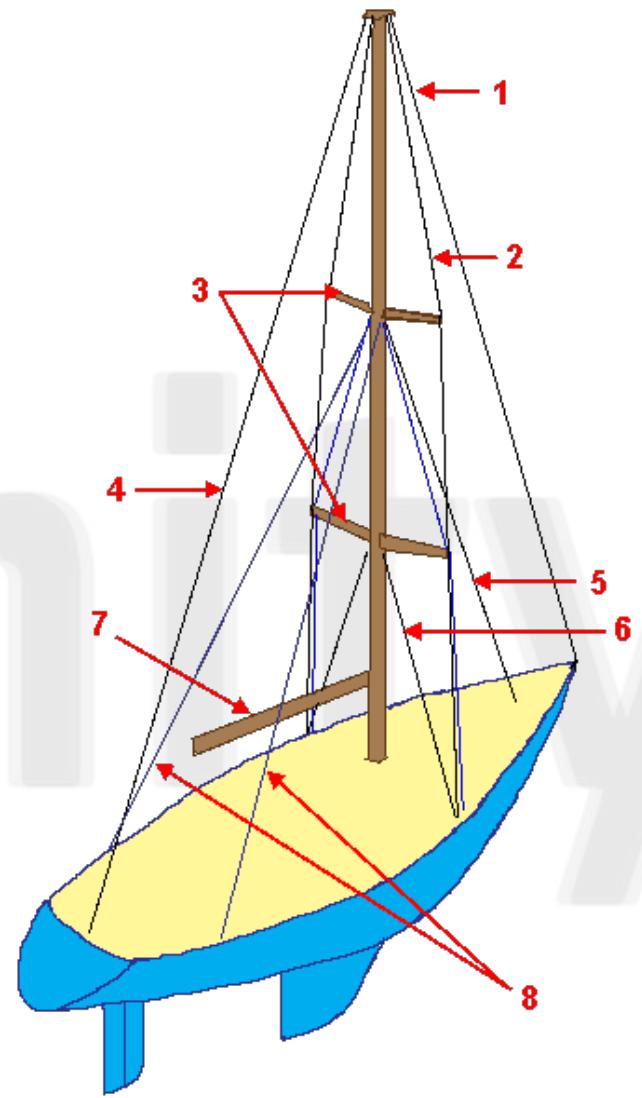
Representar o modelo no plano





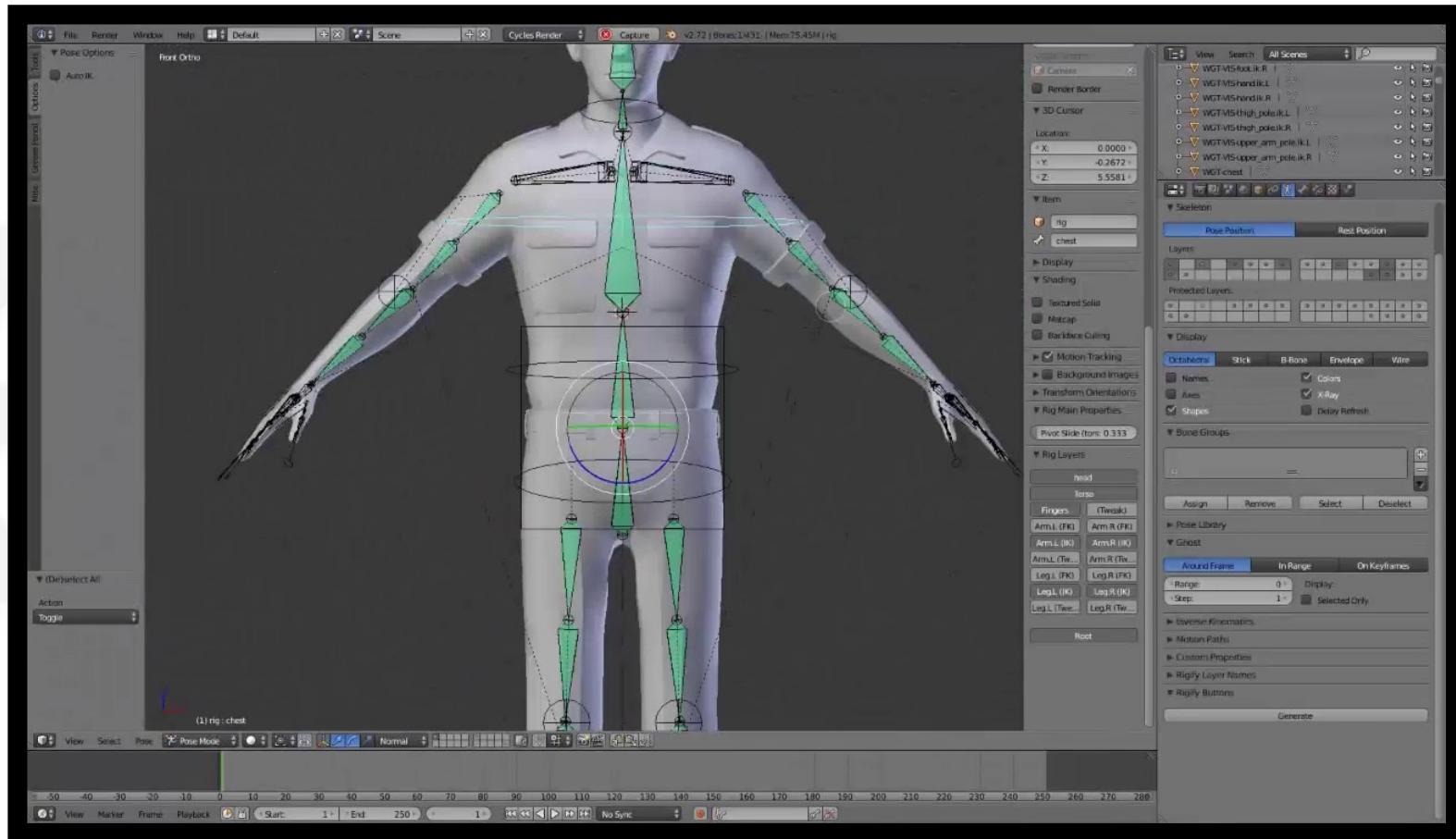
Rigging

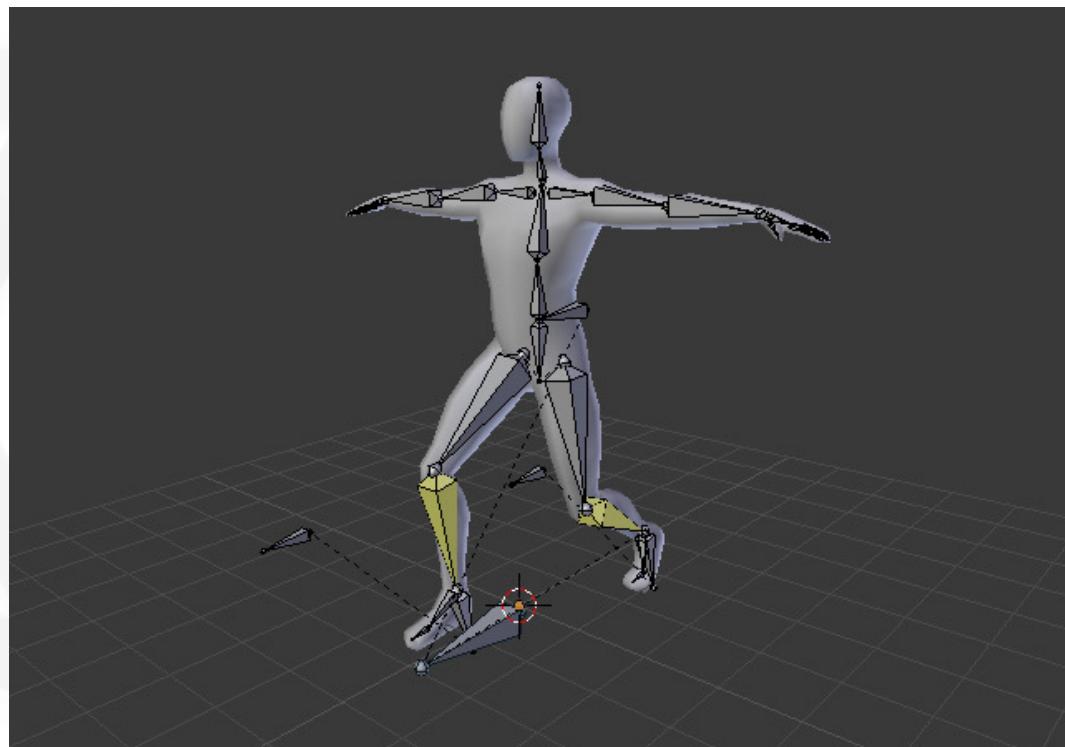
unity

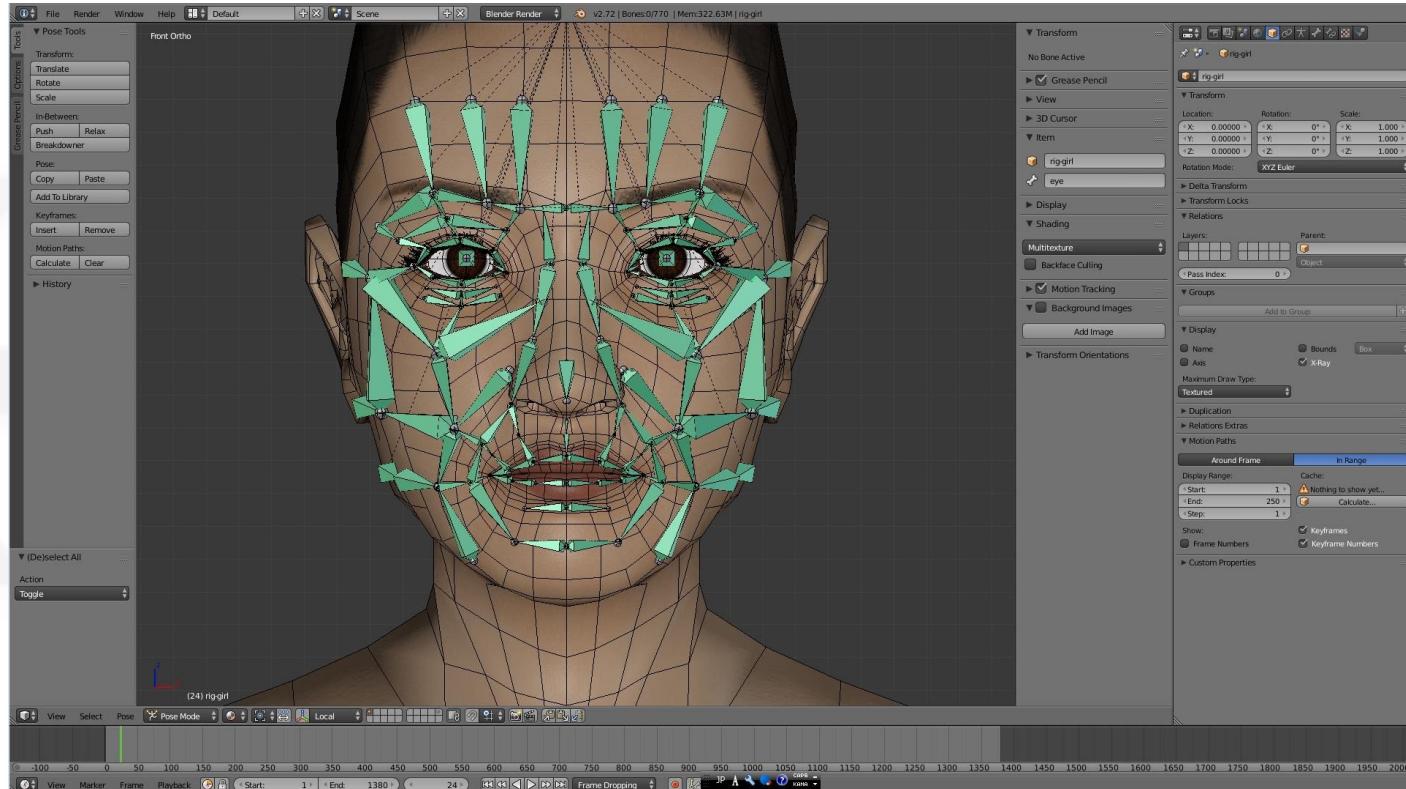


- 🎮 Criação de um esqueleto
- 🎮 Adição de movimentos
- 🎮 CURIOSIDADE: A primeira engine a ter suporte a rigging foi da Valve no jogo *Half Life*
- 🎮 *GoldSrc*











Material



- 🎮 Configurar o Aspecto Visual
- 🎮 Cores Básicas
- 🎮 Como o modelo reflete a luz
- 🎮 Qual o *material* do game *object*?



É um arquivo, onde se aplica a
textura e o *shader*



