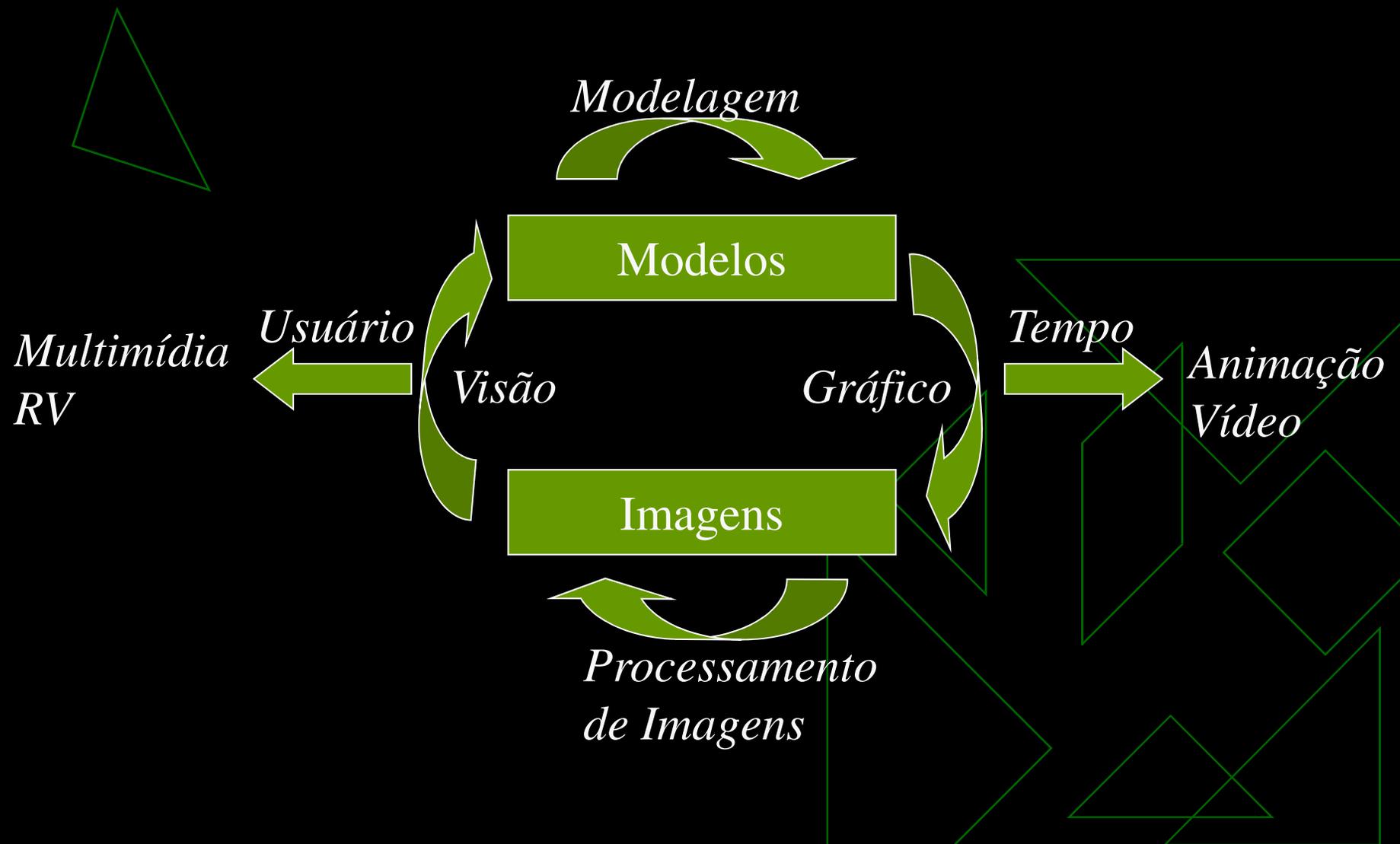


O que é CG??



Soraia Raupp Musse

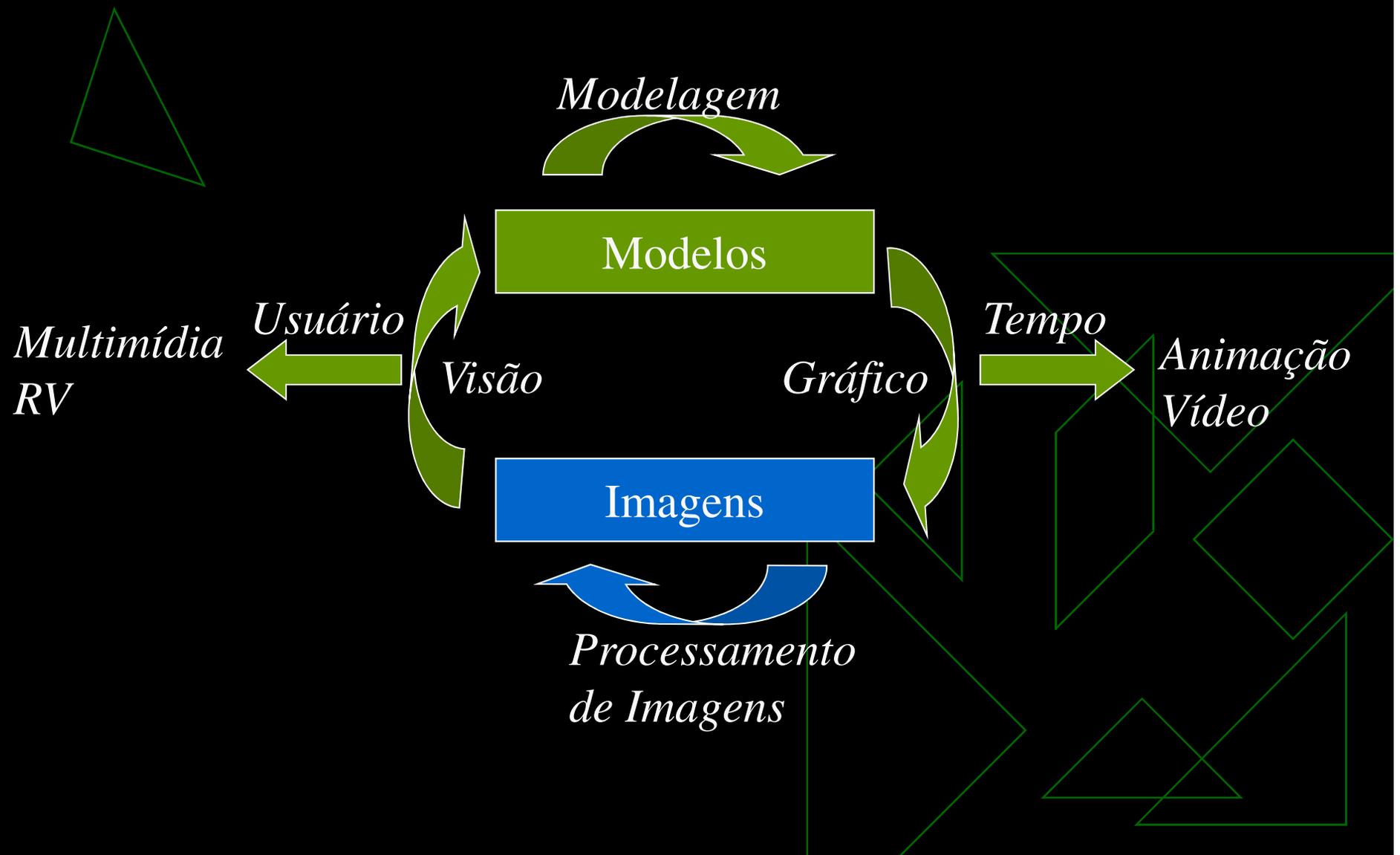
Processamento Gráfico



O que NÃO é CG??



Processamento de Imagens



Restauração de Imagens



Imagem *house* original



Imagem *house* borrada (movimento)



Imagem *house* restaurada (Wiener)



Imagem *house* ruidosa (salt & pepper)



Imagem *house* restaurada (filtro da mediana)

Compressão de Imagens

- **Compressão sem perda:** imagem reconstruída e idêntica a original. Importante no arquivamento de imagens medicas, ou de satélite.
- **Compressão com perda:** imagem reconstruída apresenta diferenças com relação a original (as vezes imperceptíveis). Uso para imagens em geral (Web, fotografias digitais, etc.)



BMP (sem compressão) - 92 KB
(153 x 204 x 3 bytes)



JPEG - 6 KB

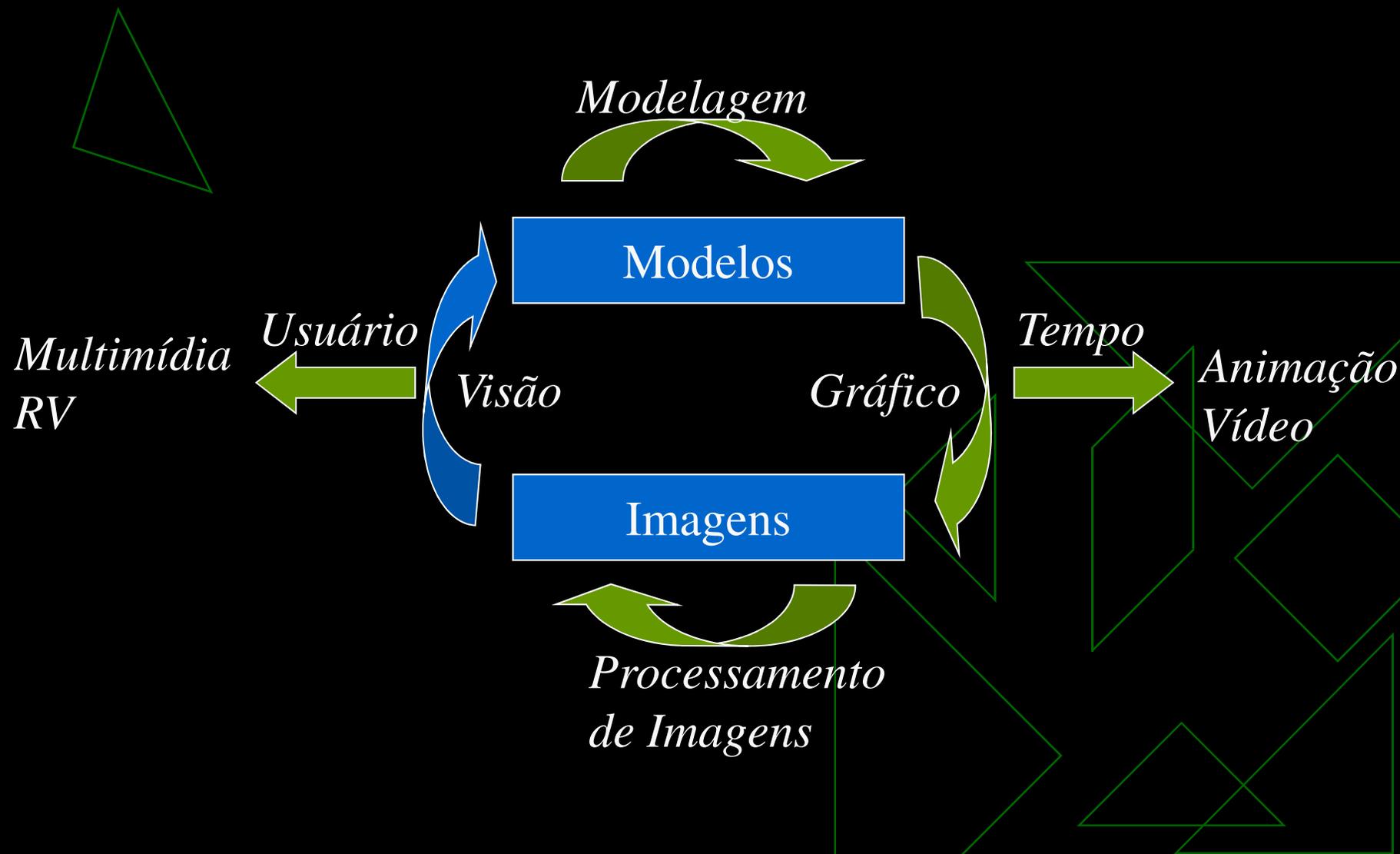


JPEG - 3 KB



JPEG - 2 KB

Visão Computacional



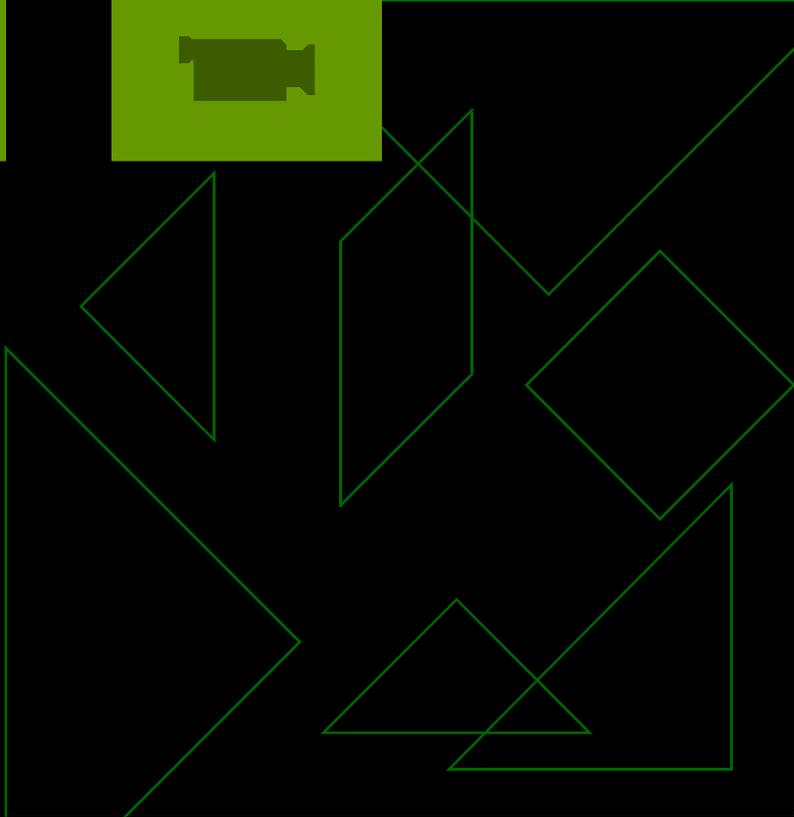
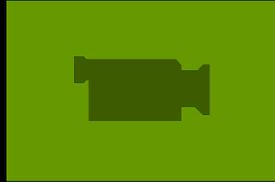
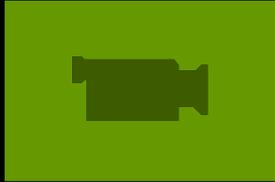
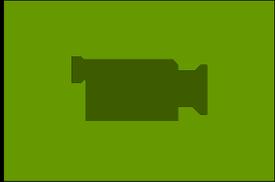


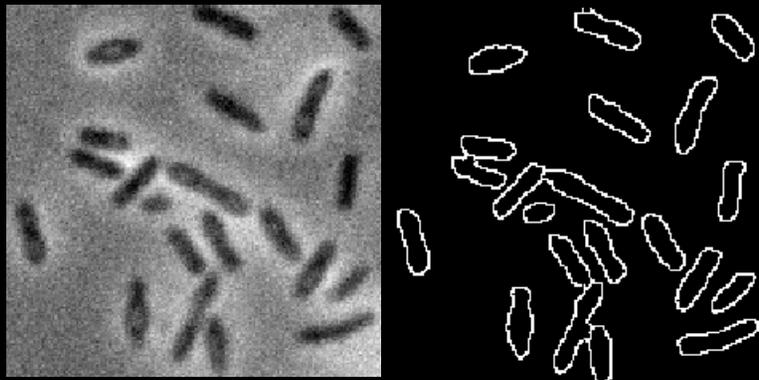
Image denoising and enhancement



Rectangle detection



Image Segmentation



People tracking





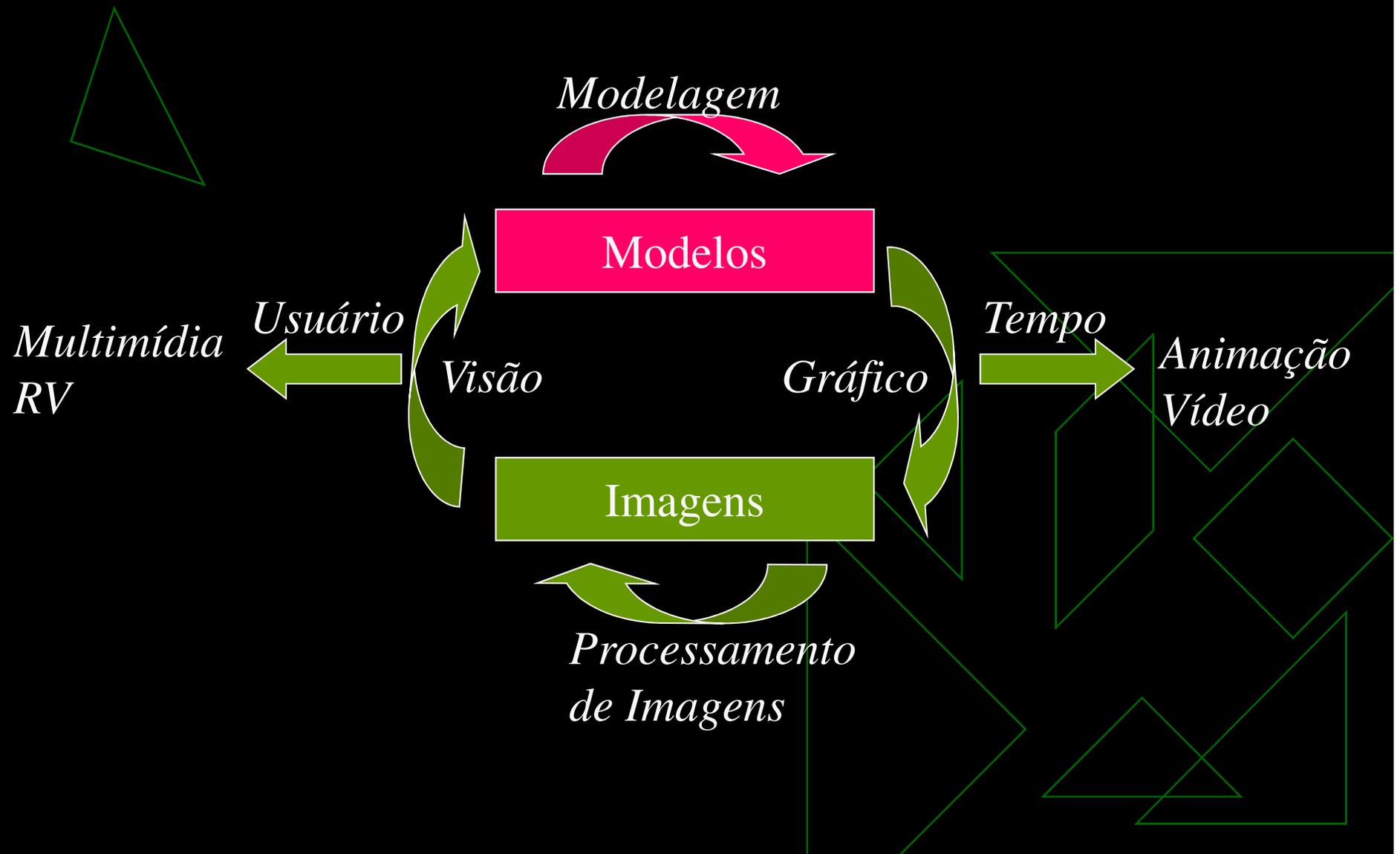
Tá, então o que é CG??

<http://www.youtube.com/watch?v=JtbDDqU3dVI>

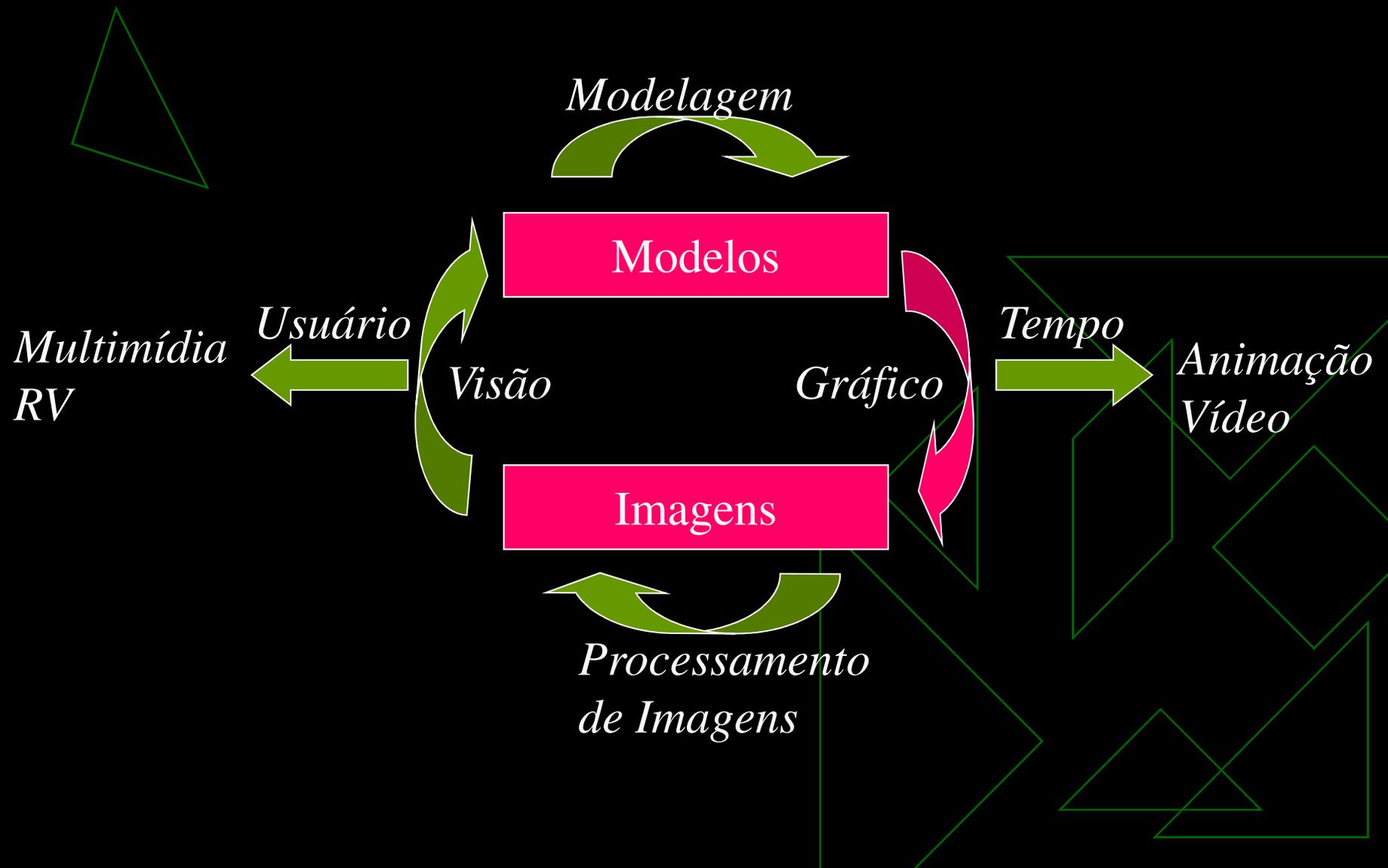
<http://www.youtube.com/watch?v=joOVlx6VxBU&feature=fvwrel>



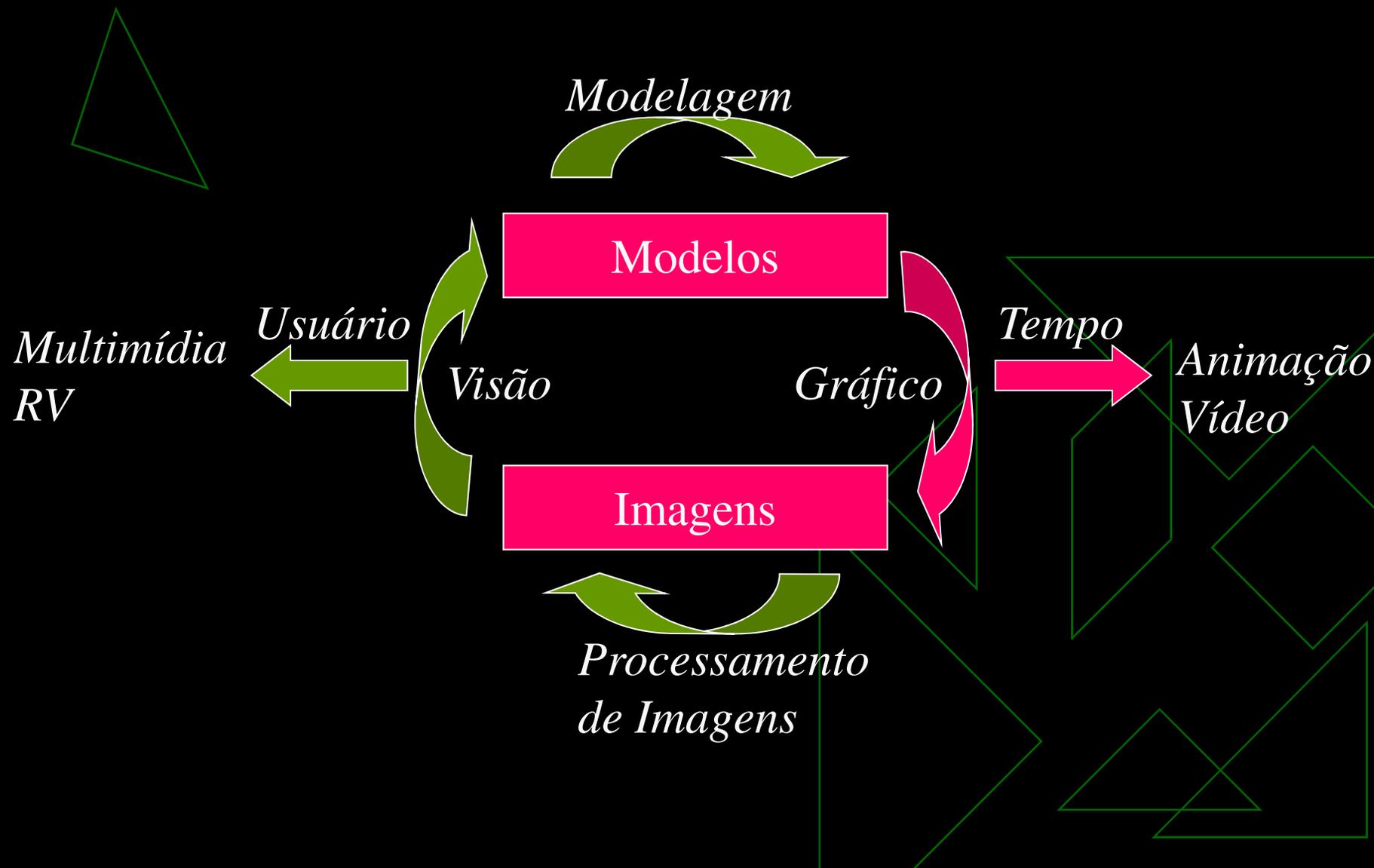
Modelagem Geométrica



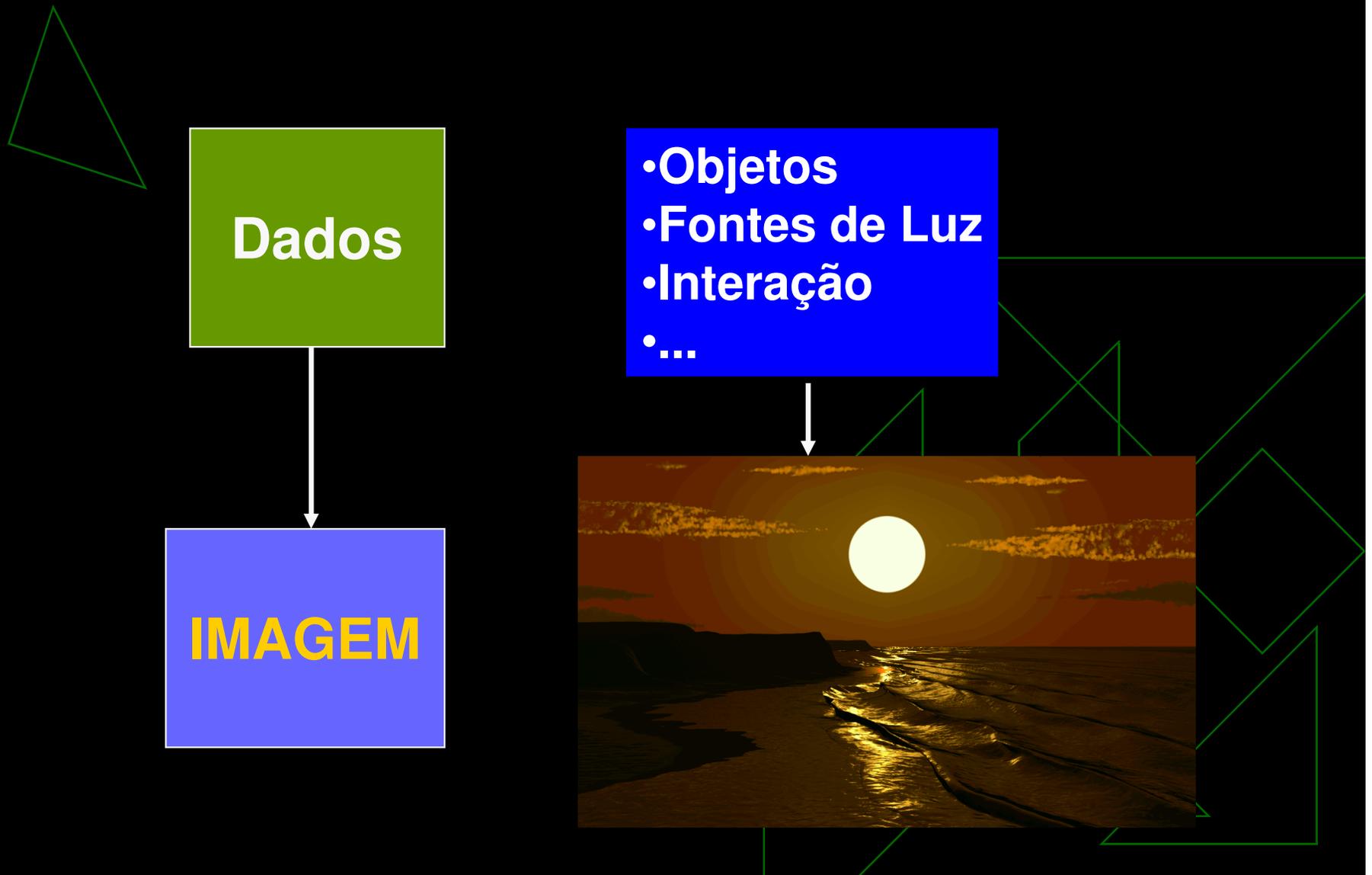
Renderização



Animação



O que é Computação Gráfica?



Temas da Computação Gráfica

Forma

Modelagem Geométrica

Aparência

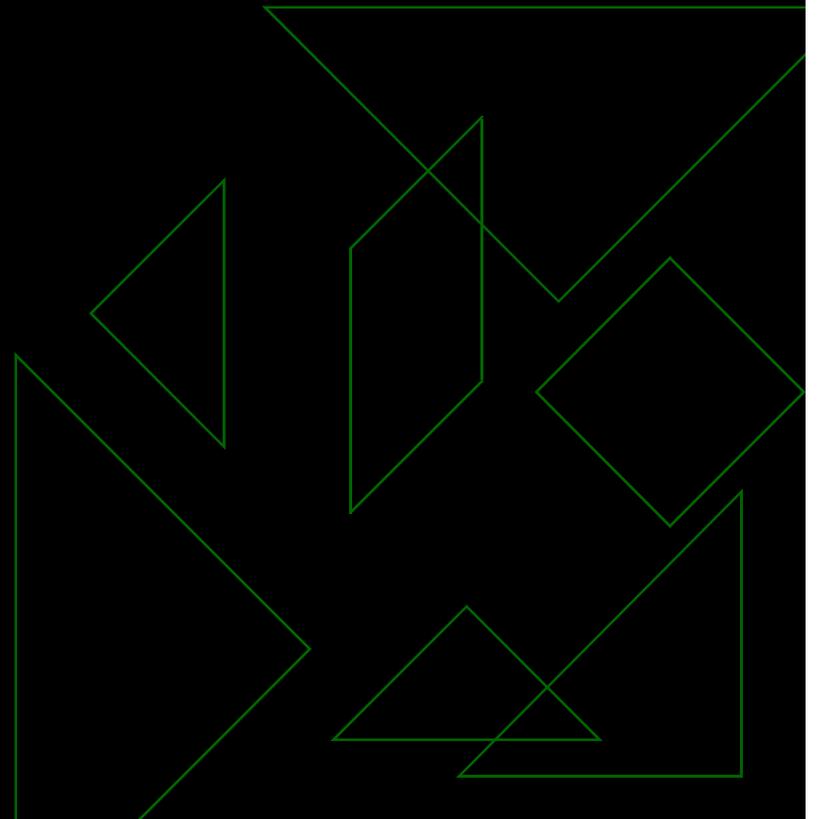
Renderização

Ação

Animação

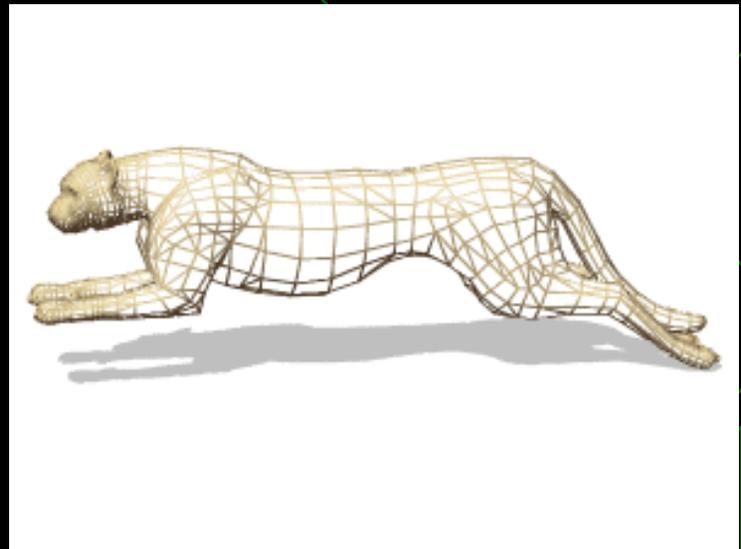
Interfaces

RV



Modelagem Geométrica

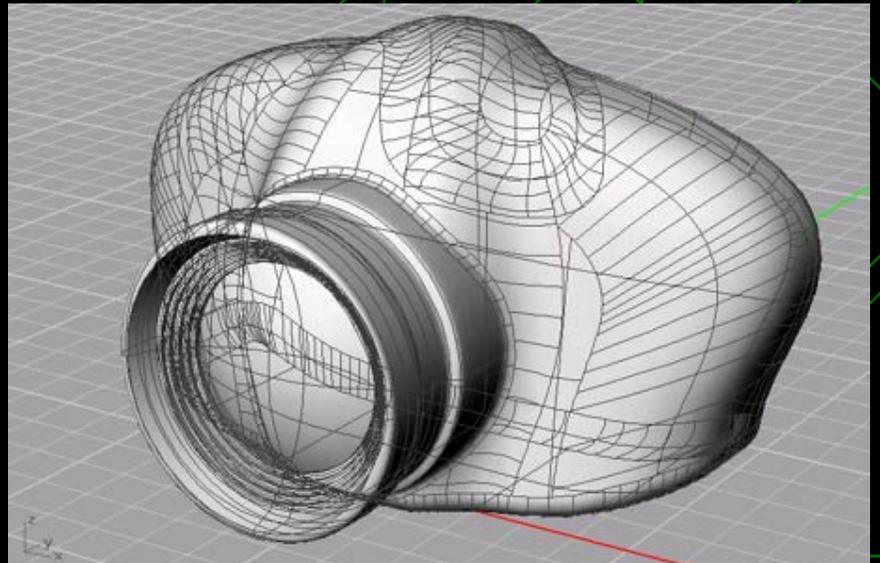
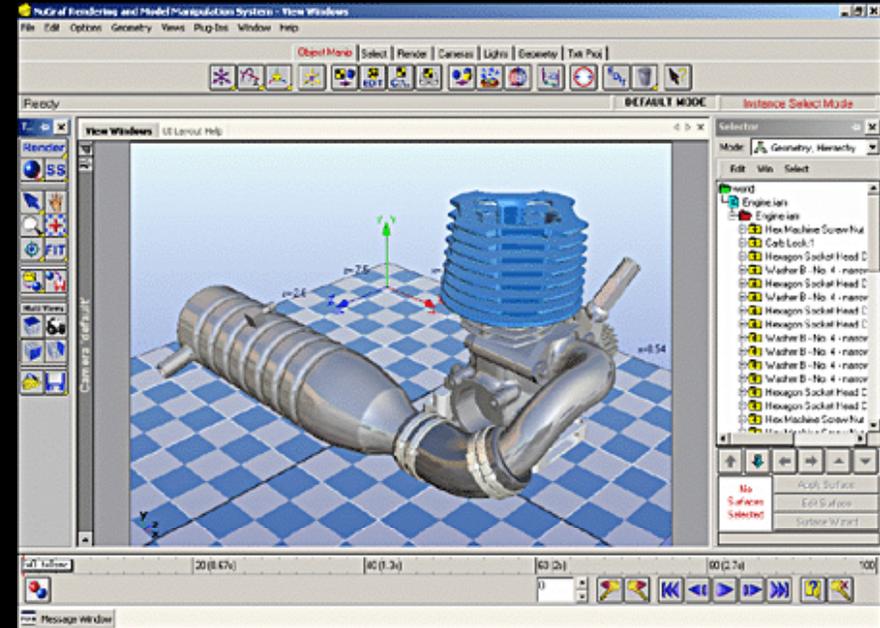
- ◆ Como criar/projetar/representar objetos
- ◆ Como representar coisas e ambientes complexos (um bicho de pelúcia é complexo?)



Coleção de vértices, conectados por arestas, formando polígonos

Modelagem Geométrica

- ◆ Como construir estas representações?
- ◆ Como armazenar essas representações?
- ◆ Qual a unidade mínima dos dados a serem usados na representação?



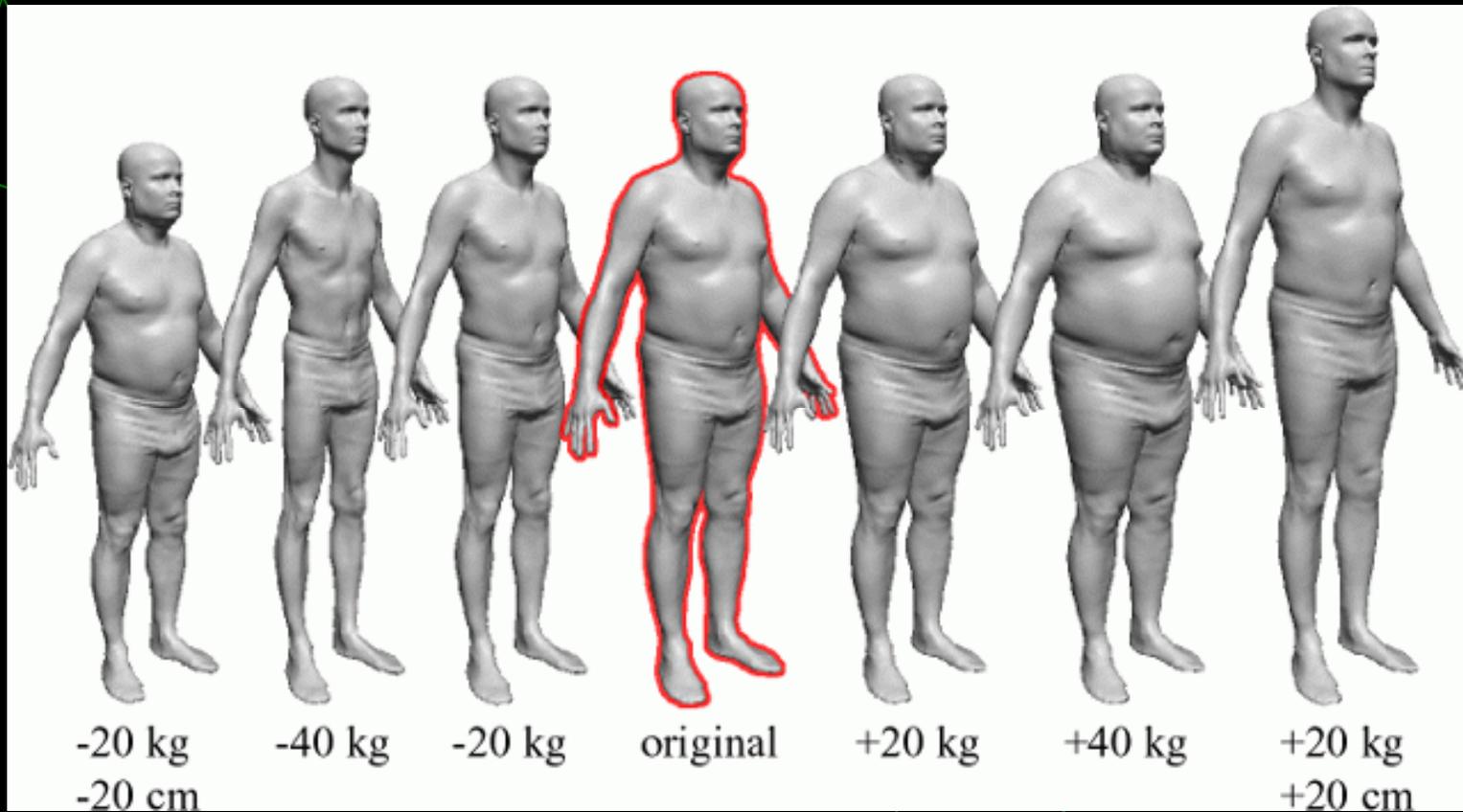
Realismo da Forma

- ◆ Métodos Matemáticos
 - Polígonos
 - Curvas e Superfícies Paramétricas

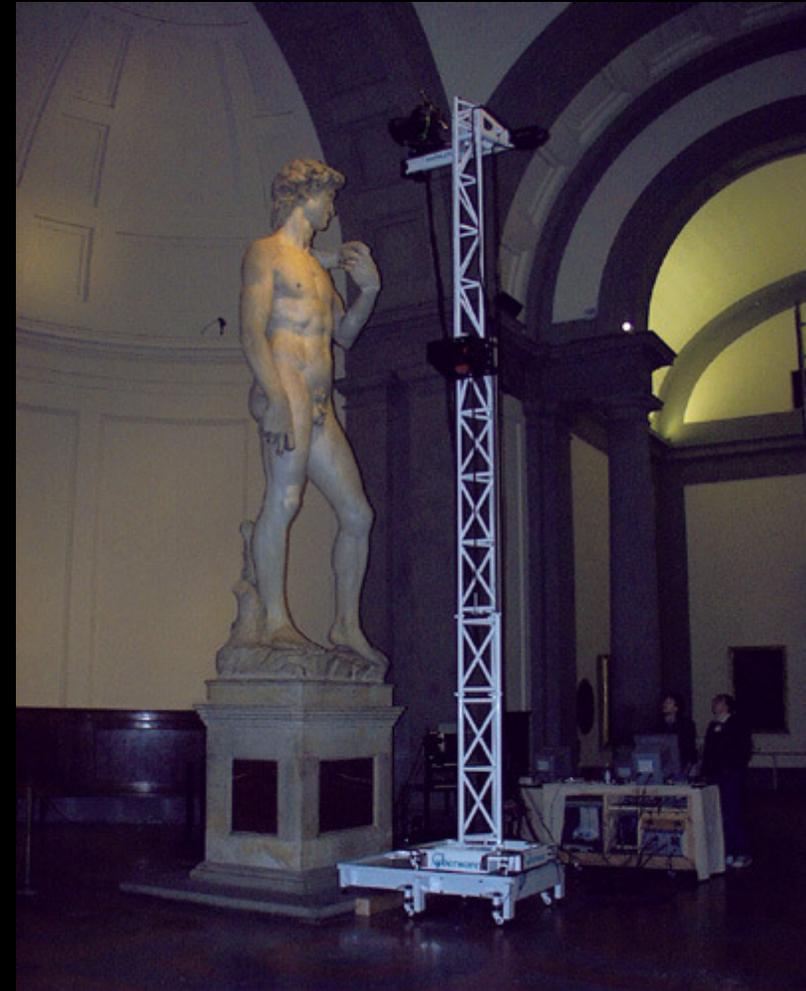


3D Studio Max

Digitalização 3D

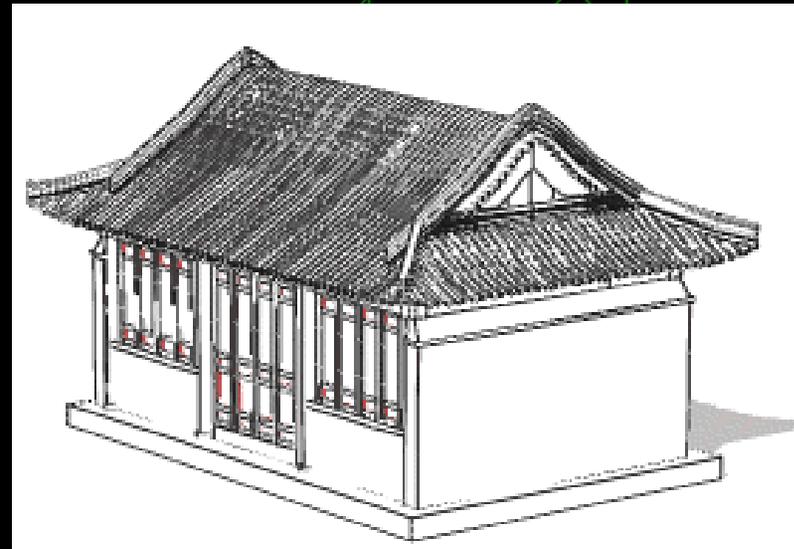
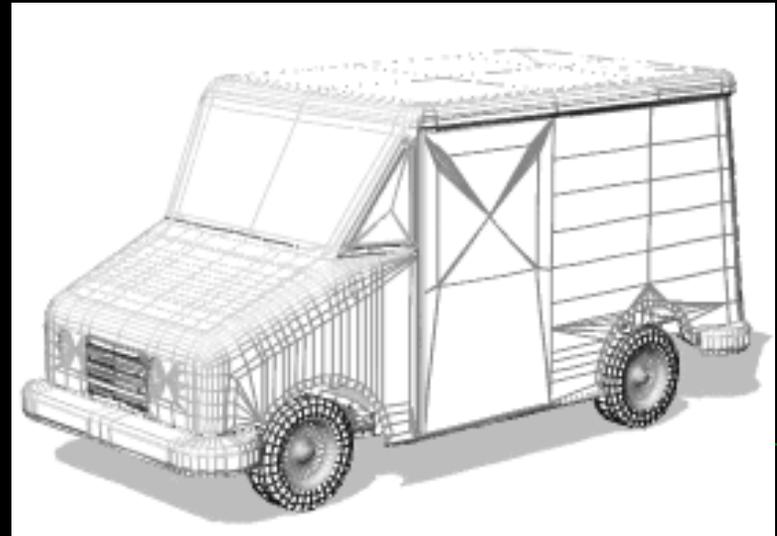
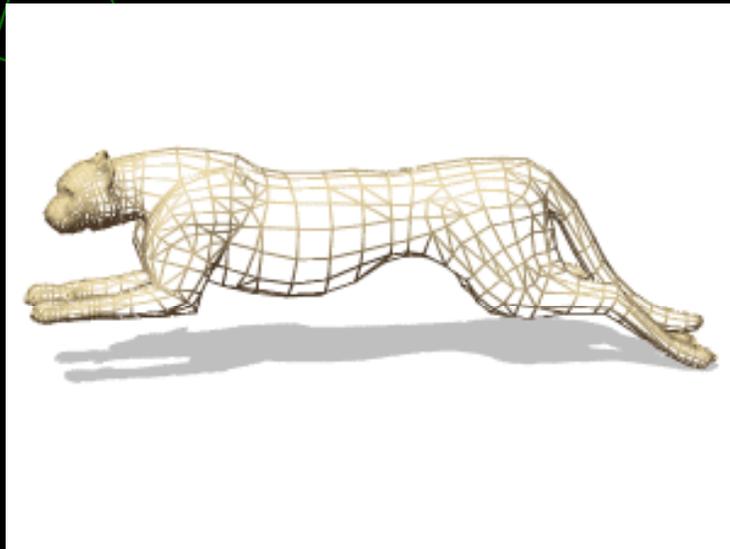


Digitalização 3D

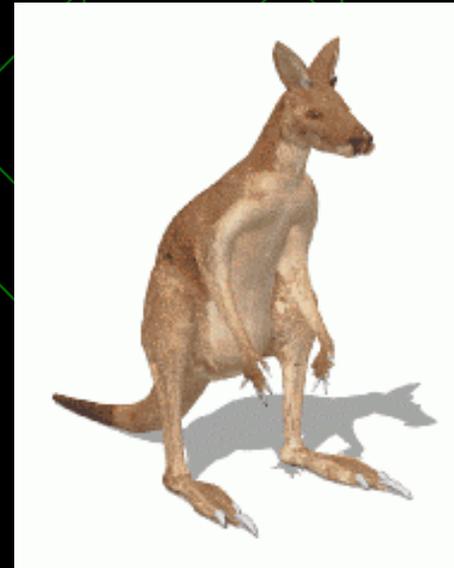


Porque digitalizar?

Exemplos



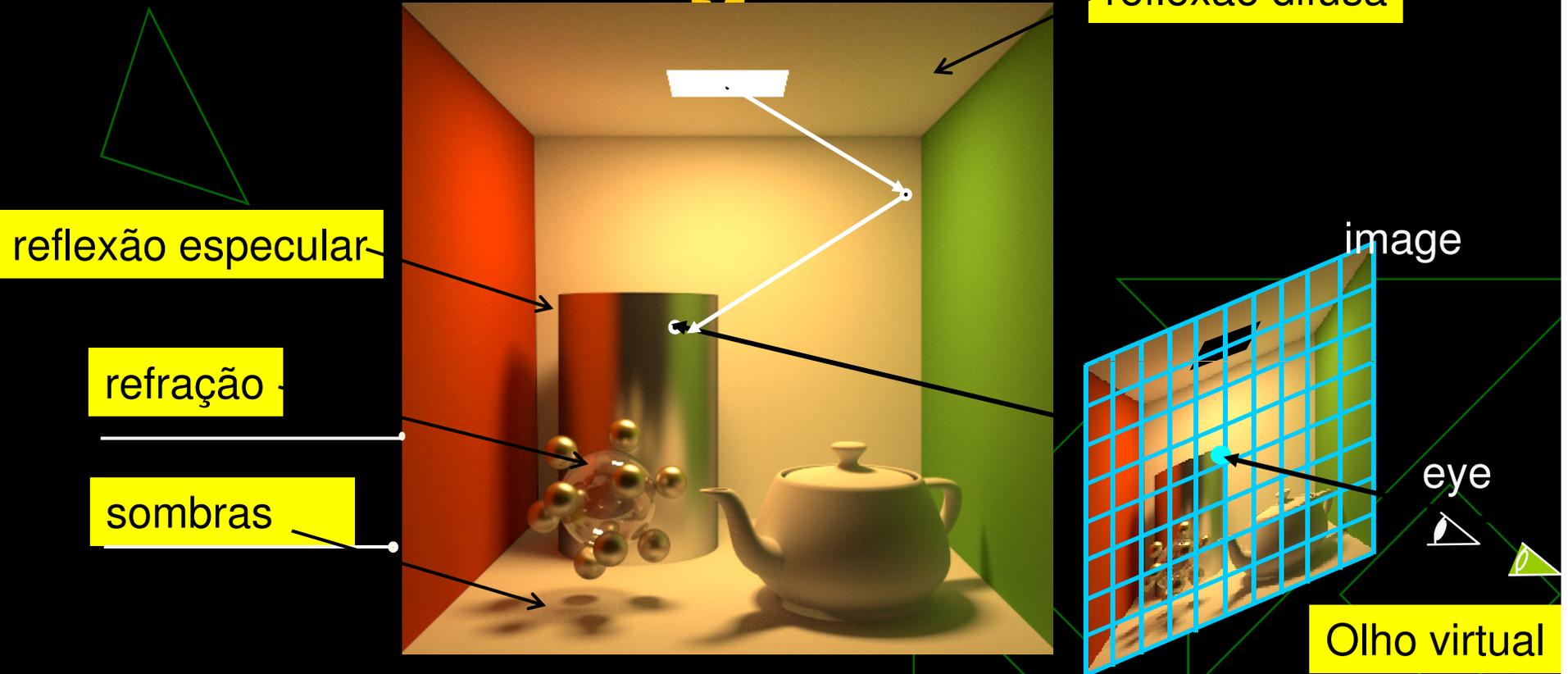
Exemplos



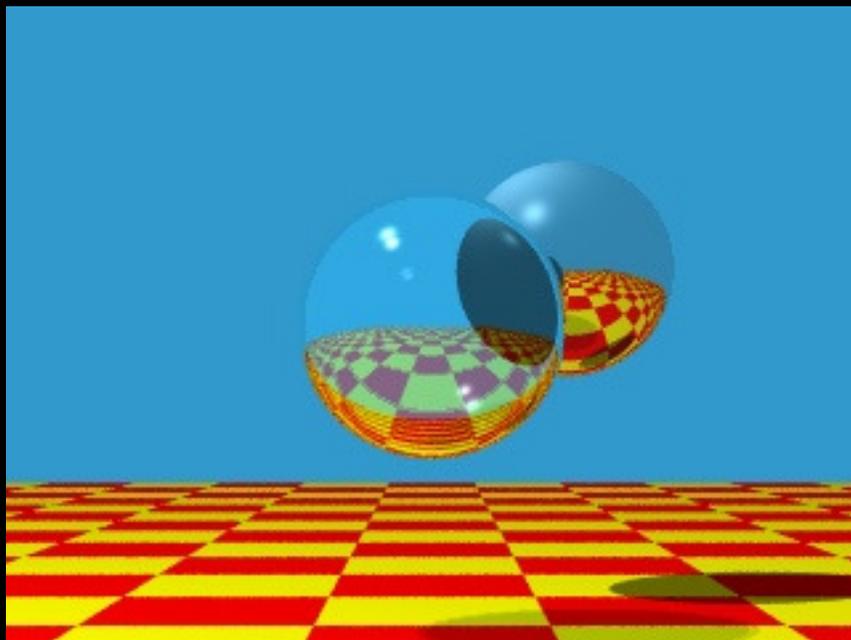
Renderização

- ◆ Uma imagem é uma distribuição de energia luminosa num meio bidimensional (o plano do filme fotográfico, por exemplo)
- ◆ Dados uma descrição do ambiente 3D e uma câmera virtual, calcular esta energia em pontos discretos (tirar a fotografia)
- ◆ Resolver equações de transporte de energia luminosa através do ambiente!!

Rendering



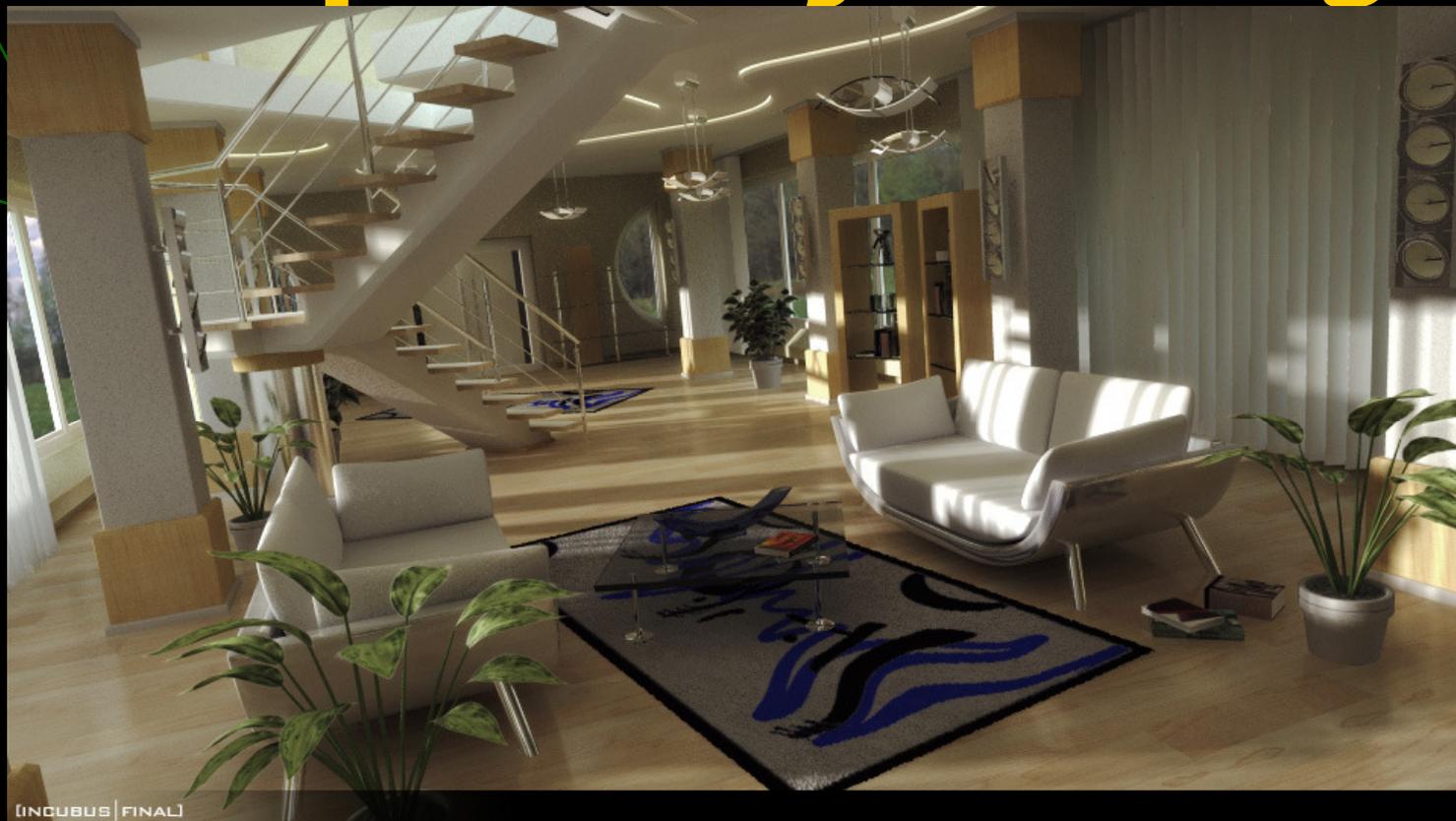
Principais fenômenos que podem acontecer na interação entre luz e objetos



Década de 80...



Exemplo – *Ray Tracing*

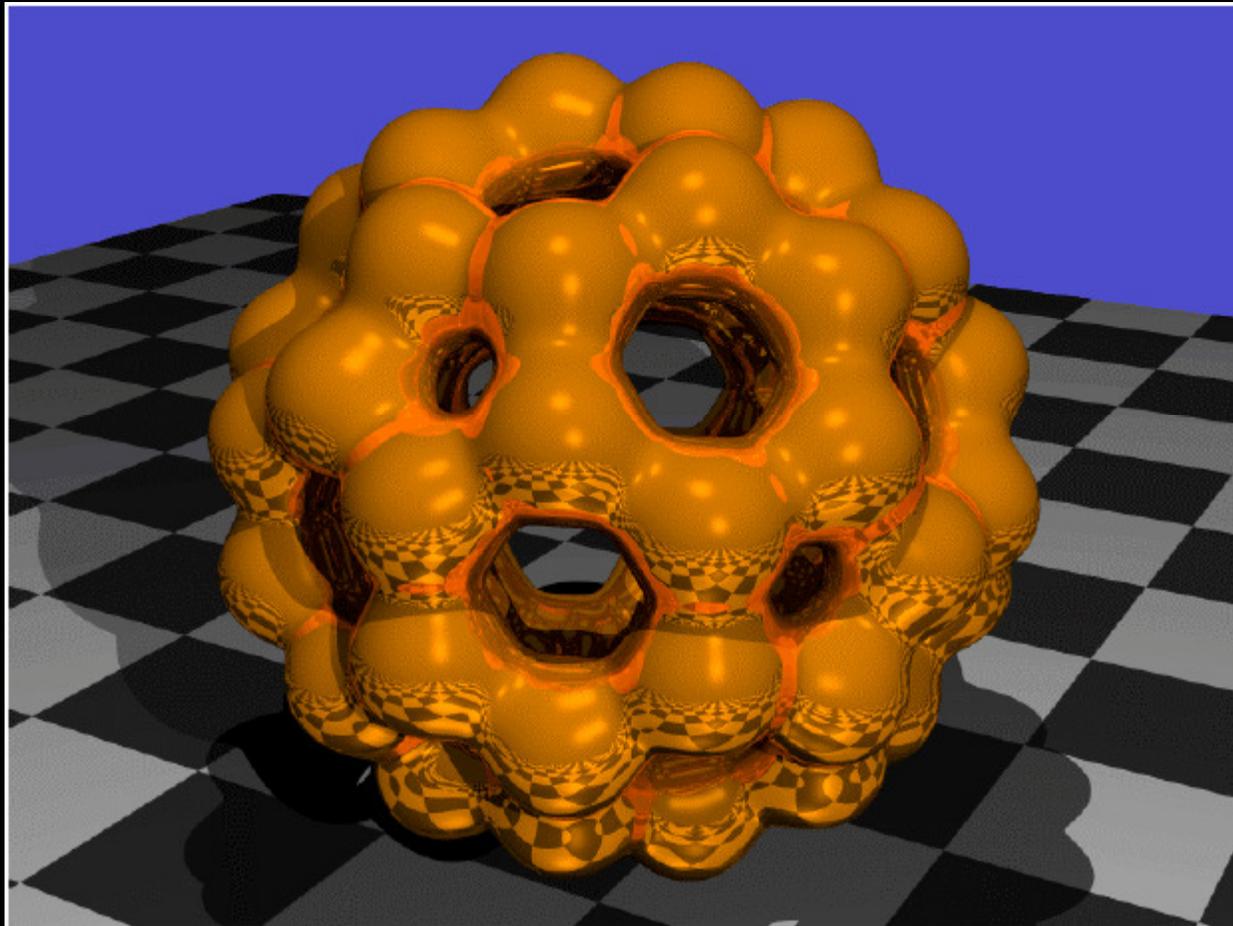


Kirschner, Andre

RENDERER USED: 3d studio max

RENDER TIME: approx 6 hours 30 minutes

HARDWARE USED: AMD1600+, ti4200



(Oliver Kreylo's Ray Tracer)

Exemplo - Radiosidade









Wrench
Wrench
Wrench

Insects
Play edition



Handwritten notes on a piece of paper, including a diagram of a spider and some text.

76.2x97.86x730

Handwritten notes on the desk surface.

Handwritten notes on the desk surface, including '3kg' and '2001'.

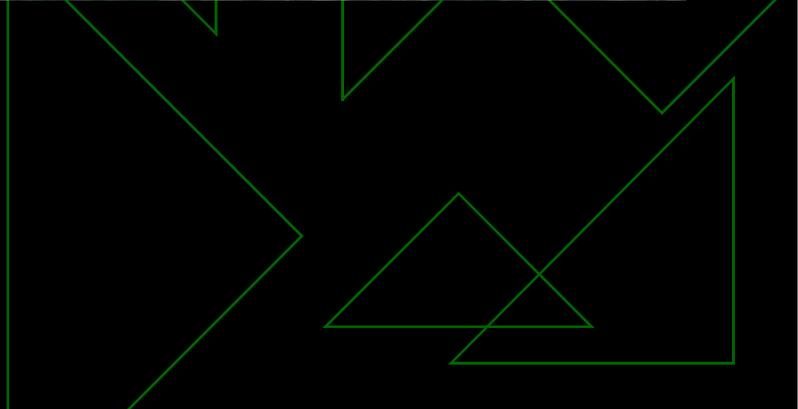
Real ou Computação Gráfica?



<http://area.autodesk.com/fakeorfoto/challenge>

Real ou Computação Gráfica?







Real ou Computação Gráfica?



Image courtesy of Glenn Melenhorst/Zephyr Animation

Photo or CG

<http://area.autodesk.com/fakeorfoto>

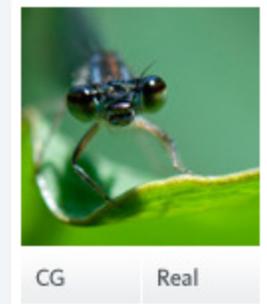
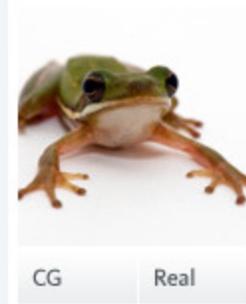
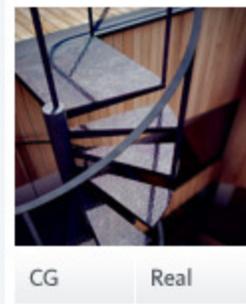
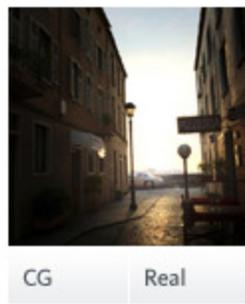
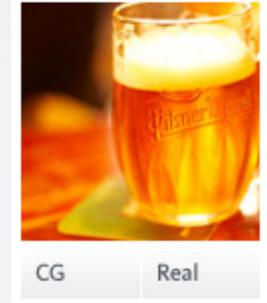
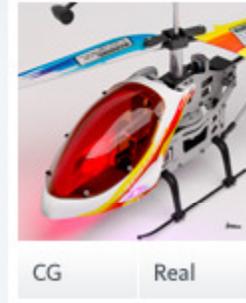
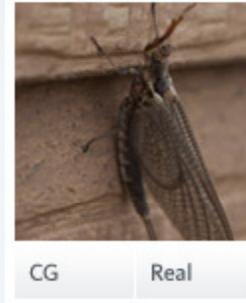
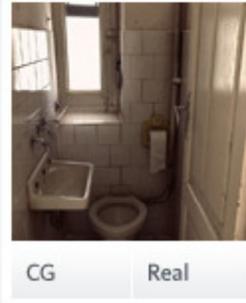
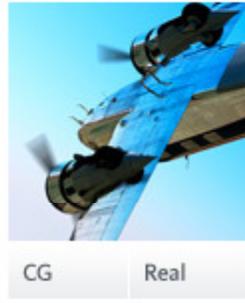
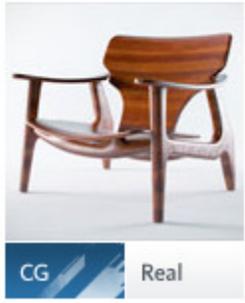
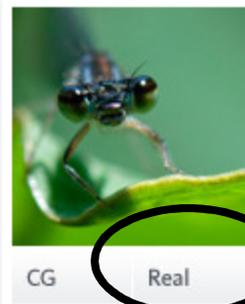
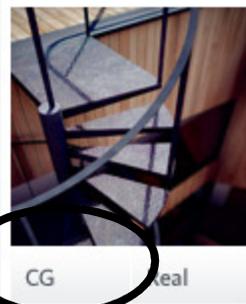
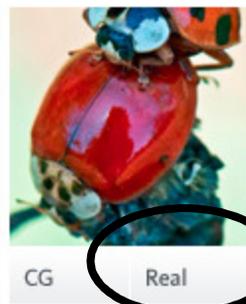
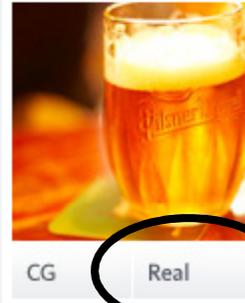
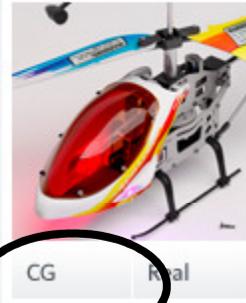
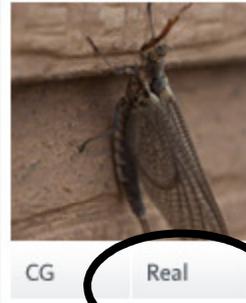
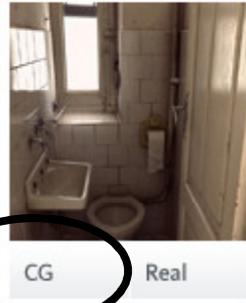
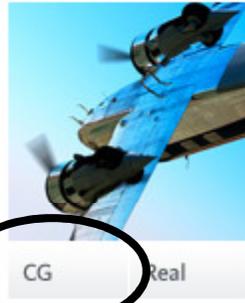
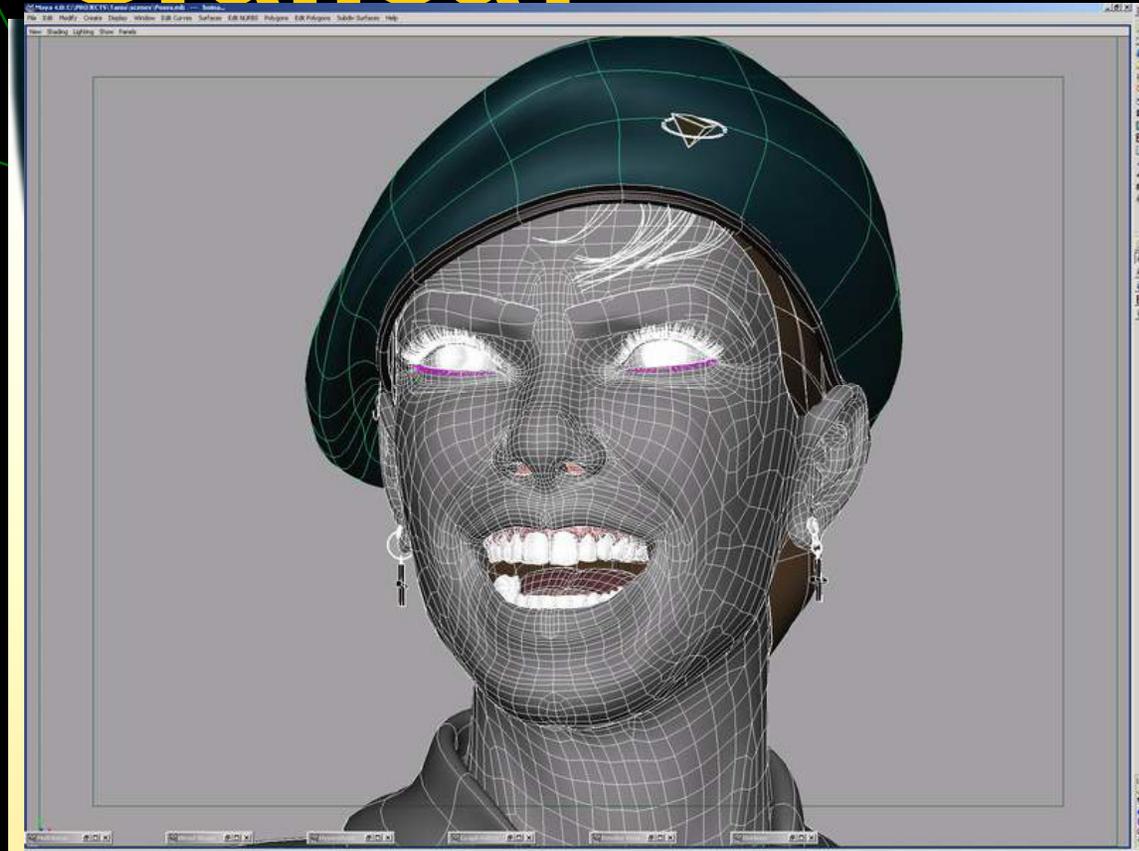


Photo or CG

<http://area.autodesk.com/fakeorfoto>

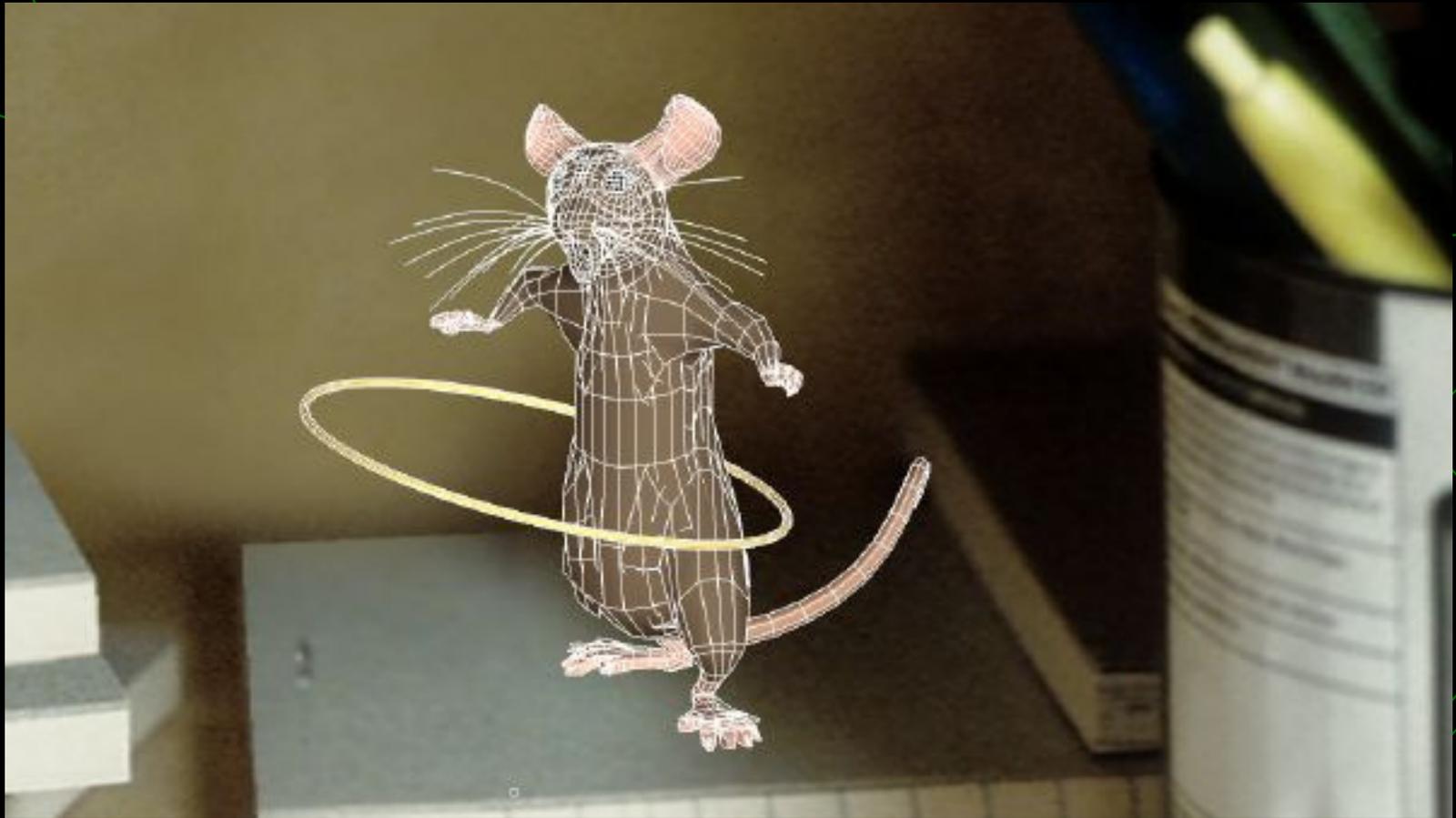


Real ou Computação Gráfica?



Alceu Baptista
Vetor Zero

Detalhes



Realismo Aparência



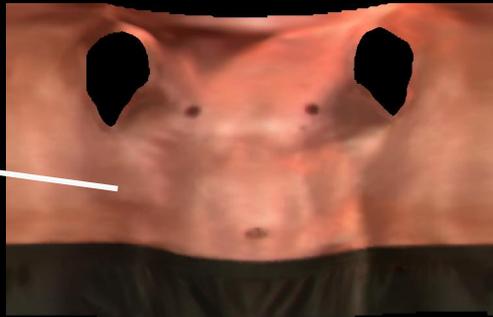
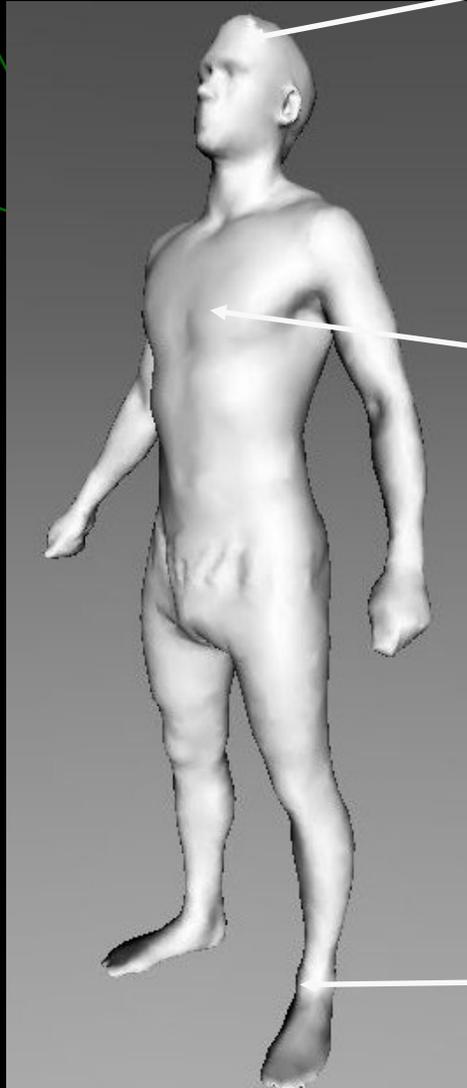
Realismo Aparência

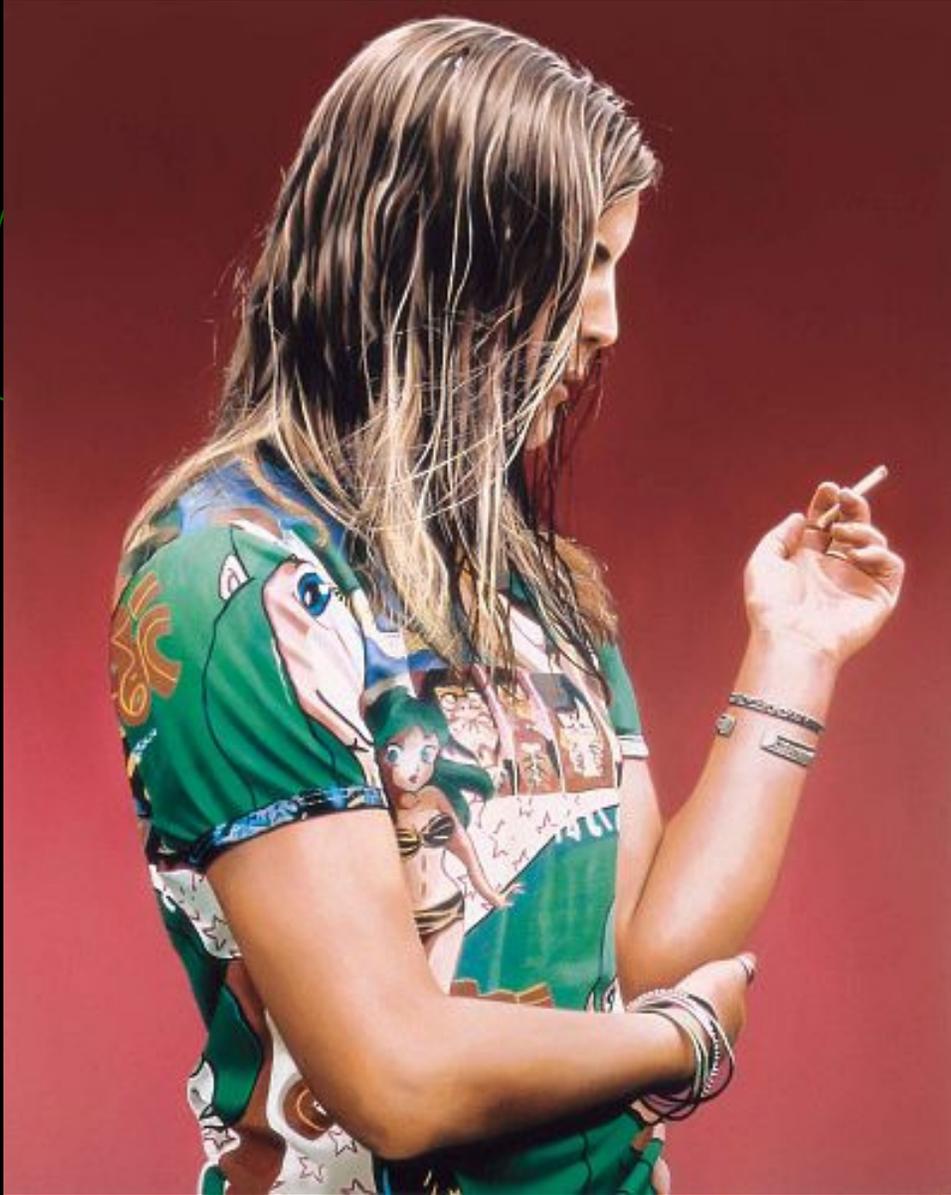


Realismo Aparência



Texturas





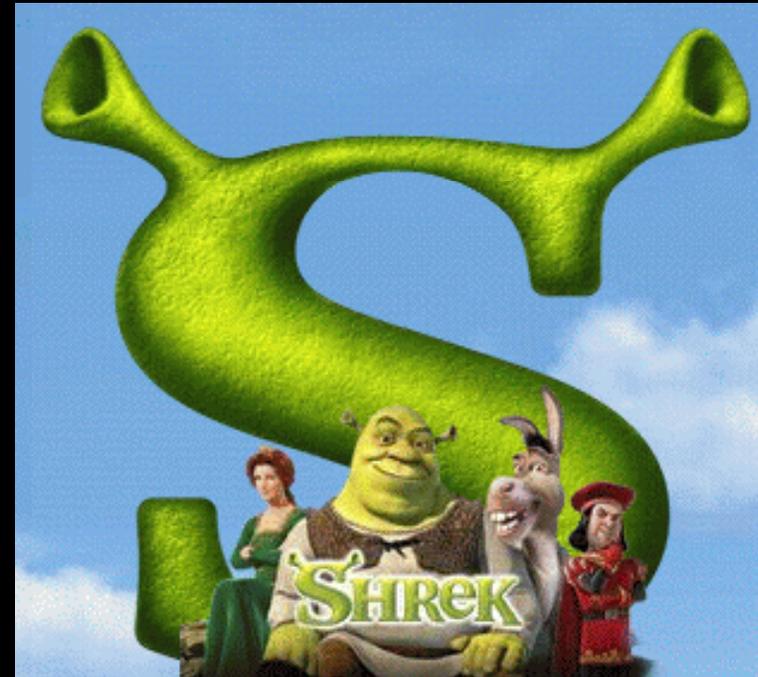
Jan Nelson - 2002



Animação

- ◆ Modelar Ações dos objetos, ou seja, como objetos se MOVEM
- ◆ Como representar movimento de objetos?
- ◆ Como especificar movimento (interativamente ou através de um programa)?
- ◆ Animação Baseada em Física/regras
- ◆ Atores Autônomos
- ◆ Captura de movimento
- ◆ Onde a IA encontra a Animação?

Exemplos Monstros, Shrek



SHREK 2 - Microsoft Internet Explorer

MEDIA | DOWNLOADS

GALLERY | VIDEO CLIPS | TRAILERS



1 2 3



Princess Fiona (CAMERON DIAZ) nervously introduces her new husband Shrek (MIKE MYERS) to her parents, King Harold (JOHN CLEESE) and Queen Lillian (JULIE ANDREWS), the rulers of Far Far Away, in DreamWorks Pictures' computer-animated comedy SHREK 2.

THE STORY MEET THE CHARACTERS MEDIA AND DOWNLOADS FUN AND GAMES BEHIND THE FAIRYTALE

Register 

HAPPILY EV... INGREDIENTS

SHREK 2

ON DVD & VIDEO
FRIDAY NOVEMBER 5TH

CLOSE

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Disney PRESENTS A PIXAR FILM

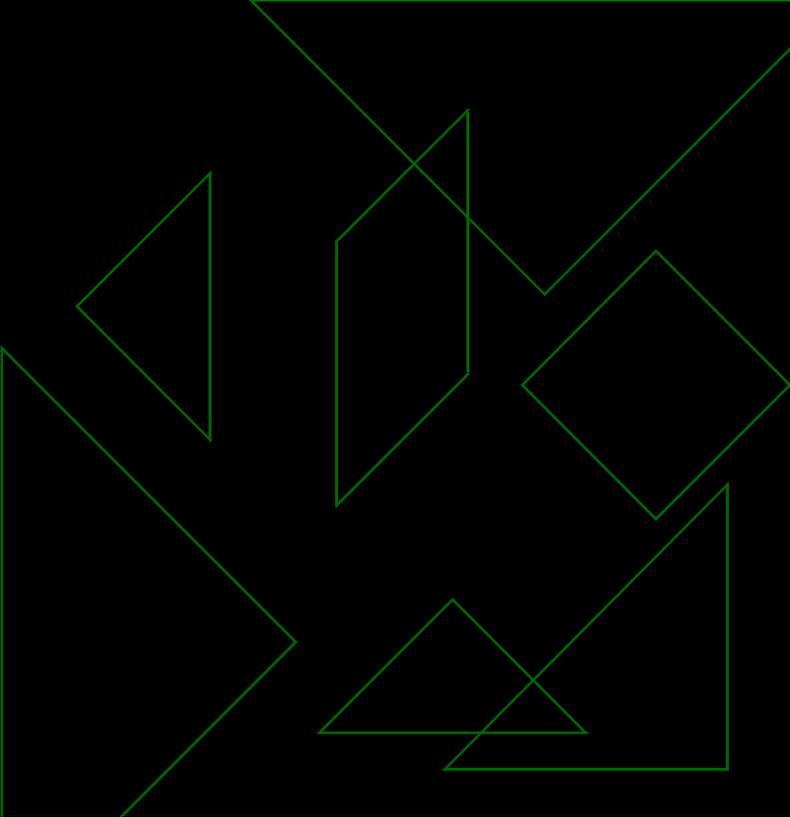
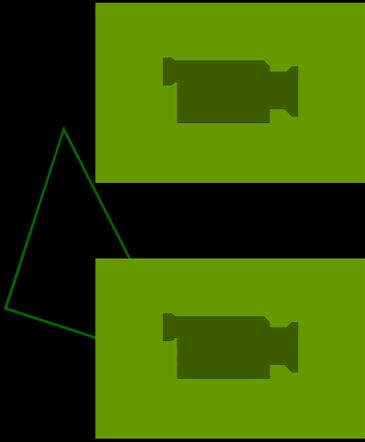


THE INCREDIBLES
SAVE THE DAY

- ENTER SITE
- WATCH TRAILERS



“Like nothing Pixar, or anyone else, has ever done before.”
Leonard Maltin, ENTERTAINMENT TONIGHT



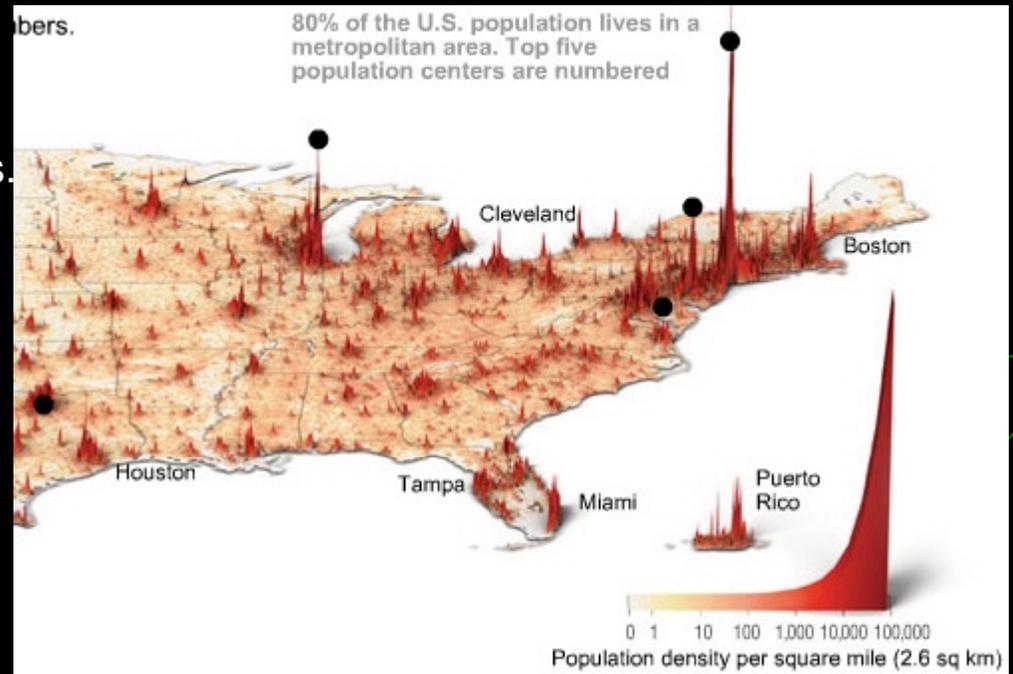
Interface HC/RV

- ◆ Técnicas para facilitar o uso de computadores por nós, seres humanos
- ◆ Trabalho interdisciplinar, normalmente envolvendo cientistas da computação, psicólogos, lingüistas e outros
- ◆ Projeto e teste de novos dispositivos
- ◆ RV

Visualização

[Time Magazine](#) uses visual hills (spikes) to emphasize the density of American population in its maps.

[We Feel Fine](#) shows human feelings, calculated from a large number of weblogs.



[Amaztype](#), a typographic book search



