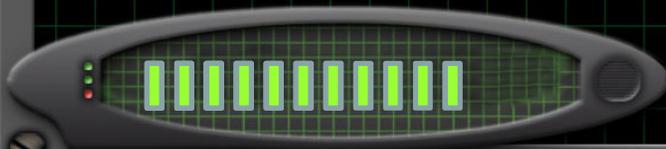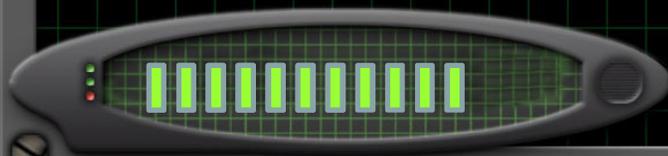# O que esperar do Futuro dos Vídeo Games?
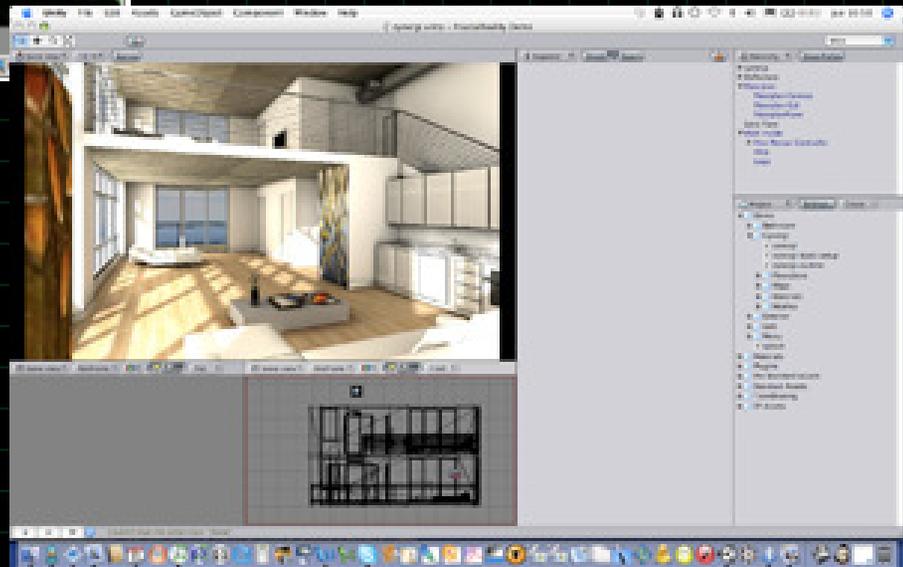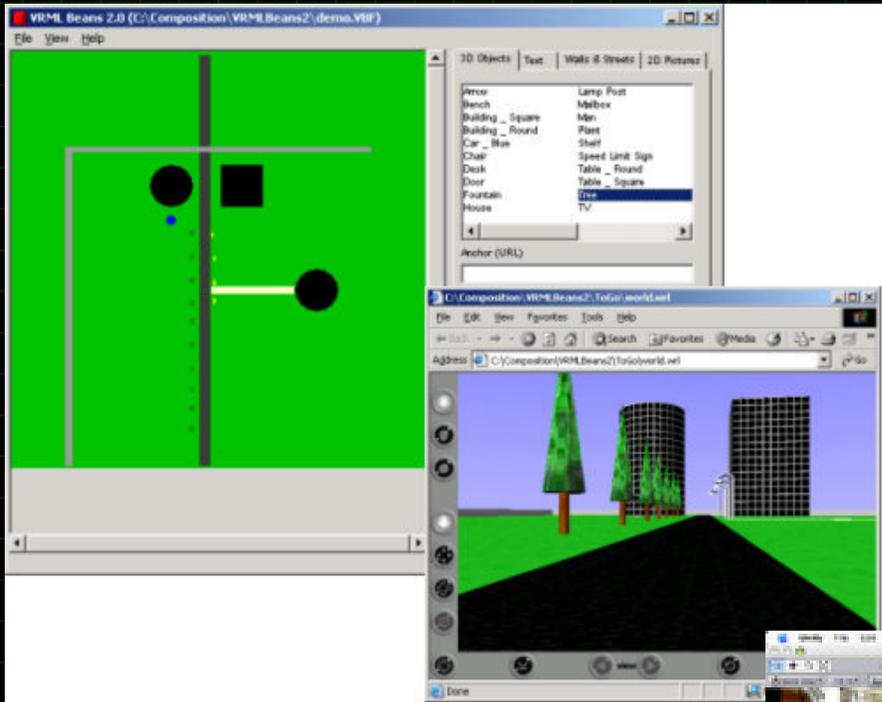
Esteban Walter Gonzalez Clua

Medialab - Instituto de Computação

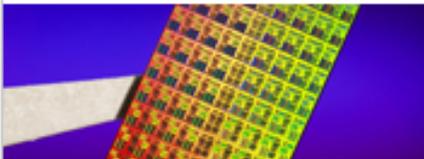Universidade Federal Fluminense

START

O que homem na Lua tem haver com o meu almoço?

Arquiteturas baseadas em muitos núcleos

80-Core Programmable Processor First to Deliver Teraflops Performance

Intel Corporation researchers have developed the world's first programmable processor that delivers supercomputer-like performance from a single, 80-core chip not much larger than the size of a finger nail while using less electricity than most of today's home appliances. [Windows Media* 4MB]

View Video Demo >
View Animation >

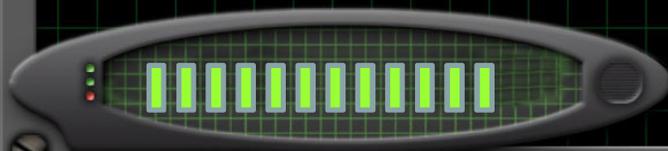## The Fastest Just Got Faster

Get unparalleled performance with the unlocked, ultra-threaded all new 2010 Intel® Core™ i7-980X processor Extreme Edition, the world's fastest‡1, smartest desktop PC processor.

Learn more ⊙

- Automatically speeds up when your PC needs extra performance◦1. That's Intel® Turbo Boost Technology.
- Features 12-way multitask processing that allows each core of your processor to work on two tasks at the same time◦2. That's Intel® Hyper-Threading Technology.
- Overclock-enabled‡2 so you can tune your system for extra performance.
- Perfect for power users who demand unlimited digital creativity and extreme gamers who demand unmatched desktop performance.
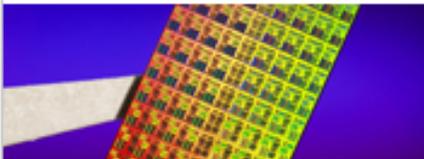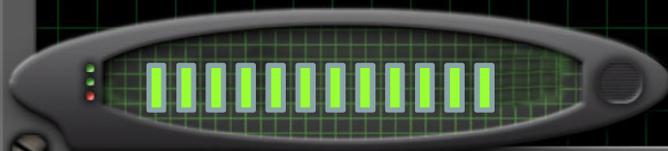
Processor Number	Cores/ threads	Clock Speed	Intel® Smart Cache	Silicon	Intel® Turbo Boost Technology	Intel® Hyper-Threading Technology
i7-980X	6 cores/ 12 threads	3.33 GHz, up to 12 MB 3.60 with turbo boost		32 nm	Yes	Yes

Arquiteturas baseadas em muitos núcleos

80-Core Programmable Processor First to Deliver Teraflops Performance

Intel Corporation researchers have developed the world's first programmable processor that delivers supercomputer-like performance from a single, 80-core chip not much larger than the size of a finger nail while using less electricity than most of today's home appliances. [Windows Media* 4MB]

View Video Demo >
View Animation >

The Fastest Just Got Faster

Get unparalleled performance with the unlocked, ultra-threaded all new 2010 Intel® Core™ i7-980X processor Extreme Edition, the world's fastest‡1, smartest desktop PC processor.

Learn more ⊕

- Automatically speeds up when your PC needs extra performance◊1. That's Intel® Turbo Boost Technology.
- Features 12-way multitask processing that allows each core of your processor to work on two tasks at the same time◊2. That's Intel® Hyper-Threading Technology.
- Overclock-enabled‡2 so you can tune your system for extra performance.
- Per
- cre
- uni

extreme gamers

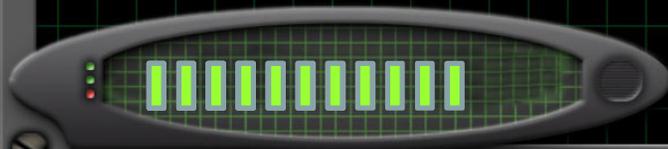| Processor Number	Cores/ threads	Clock Speed	Intel® Smart Cache	Silicon	Intel® Turbo Boost Technology	Intel® Hyper-Threading Technology
i7-980X	6 cores/ 12 threads	3.33 GHz, up to 3.60 with turbo boost	12 MB	32 nm	Yes	Yes

GPUs

GeForce GTX 480

Pure adrenaline meets visual bliss

BUY NOW

⊕ Additional Views

Mais sobre a arquitetura da serie 400

GPUs

Exceptional Gaming Performance

First and foremost, GF100 is designed for gaming performance leadership. Based generation Streaming Multiprocessor (SM) architecture, GF100 doubles the number the previous architecture.

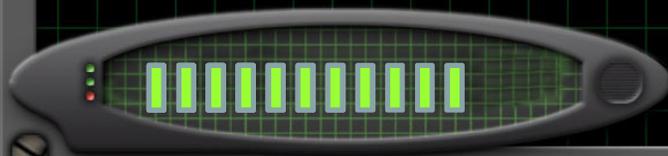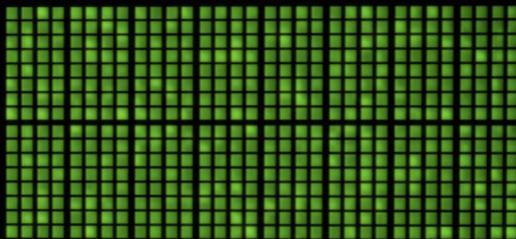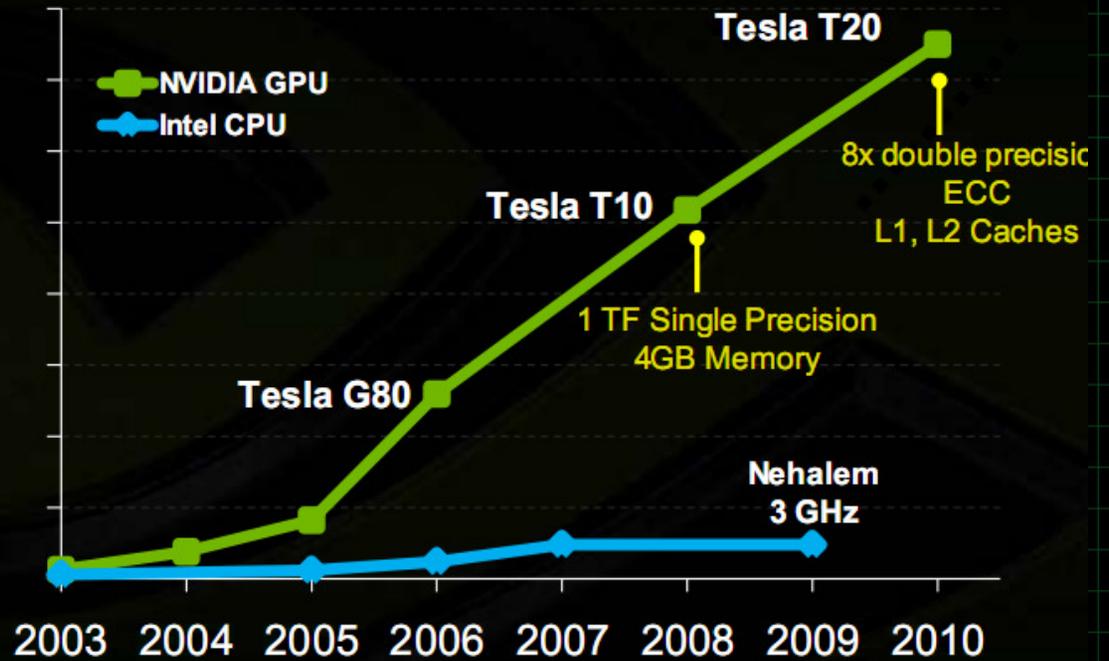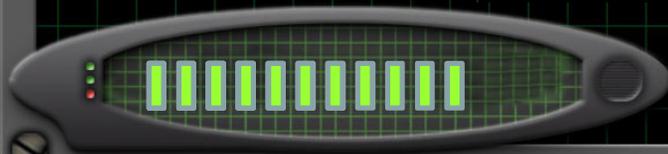### GeForce GTX 480

Pure adrenaline meets visual bliss

BUY NOW

Additional Views

Mais sobre a arquitetura da serie 400

FERMI

Gflops/sec

NVIDIA GPU
Intel CPU

Tesla T20

Tesla T10

8x double precisio
ECC
L1, L2 Caches

1 TF Single Precision
4GB Memory

Tesla G80

Nehalem
3 GHz

2003 2004 2005 2006 2007 2008 2009 2010

512 núcleos

Hierarquia de cache

8x mais rápido que Teslas

FERMI – GF100
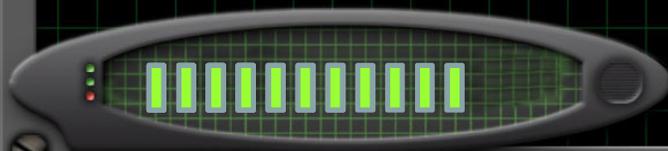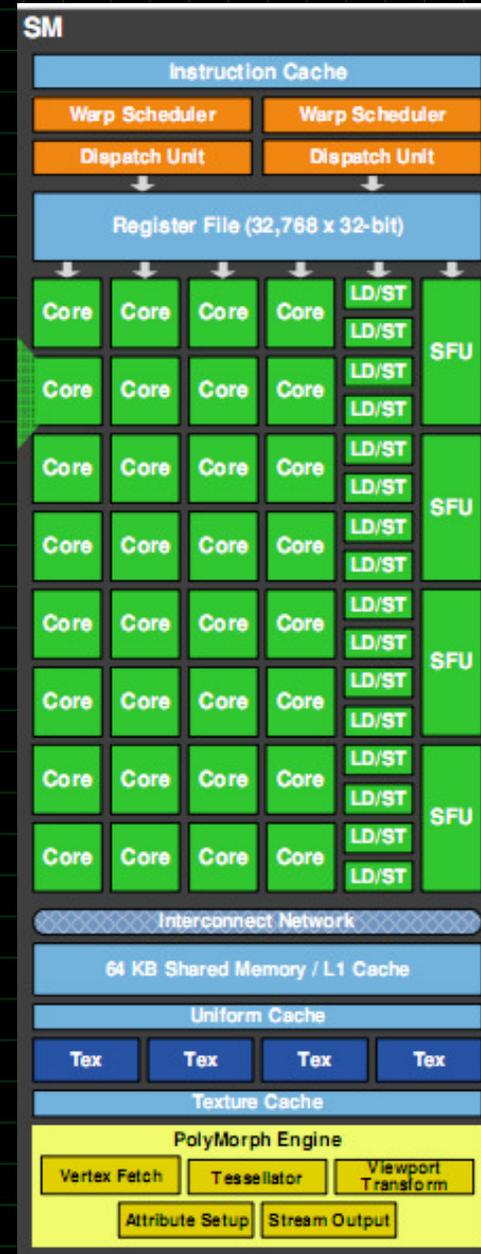
Tessellation com Displacement Mapping
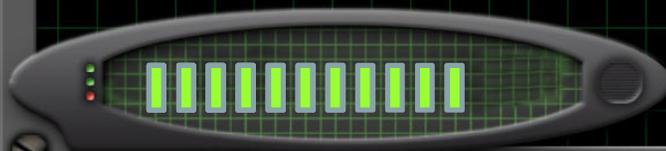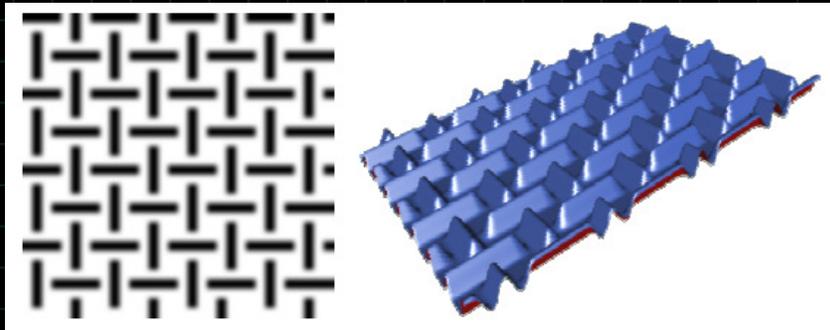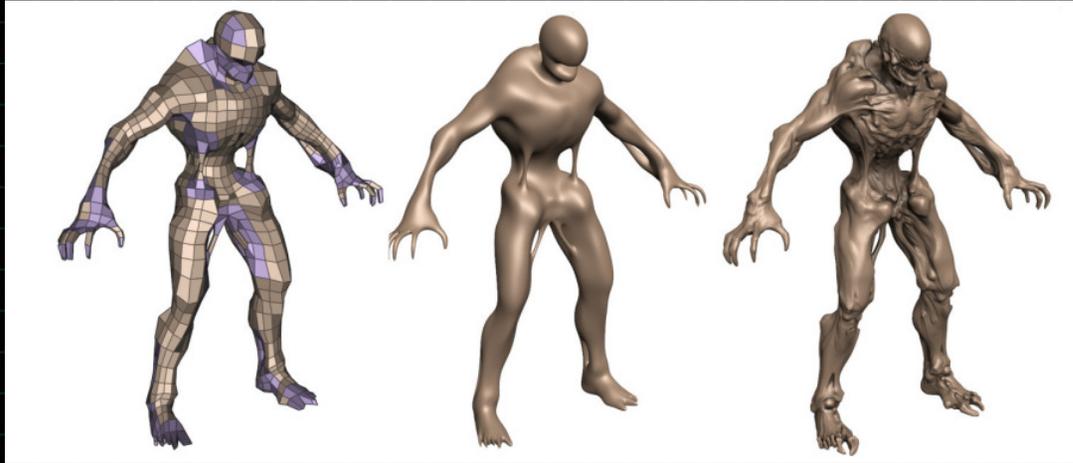
Real Time Ray-Tracing

GF100's compute architecture was built specifically with ray tracing in mind. GF100 is the first GPU to support recursion in hardware, enabling efficient ray tracing and a host of other

nVidia CompleX

nVidia OptiX

nVidia SceniX
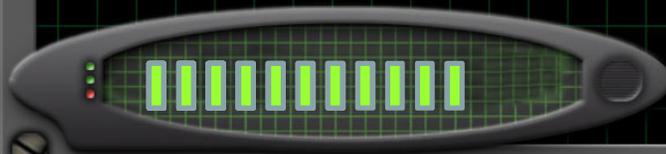
Real Time Ray-Tracing

PIPS:lab

PLEIX

The Soul of a Supercomputer in the Body of a GPU
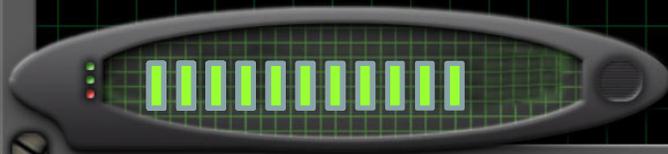
Modelagem da Hashed Octree em Arquitetura de GPUs

Projeto em colaboracao com PUC-Rio

Limitações das GPUs:

-Comunicacao com a CPU

- arquitetura da memoria

- operacoes custosas: random, modulo

- impossibilidade de uso de ponteiros
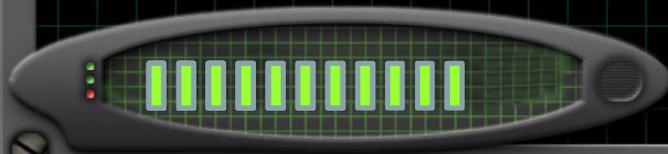
Modelagem da Hashed Octree em Arquitetura de GPUs

Projeto em colaboracao com PUC-Rio

- Cada busca é implementada por uma thread

- Utiuliza-se o codigo de Morton para codificação da tabela de Hash

- Otimização estatística para gerar código de busca

Modelagem da Hashed Octree em Arquitetura de GPUs

Projeto em colaboracao com PUC-Rio

• Cada busca é implementada por uma thread

• Utiliza-se o codigo de Morton para codificação da tabela de Hash

• Otimização estatística para gerar código de busca

Tamanho da tabela hash (em número de elementos)				
	2,000,000	1,000,000	500,000	250,000	100,000
CPU	5 s	2 s	1 s	1 s	1 s
GPU	0.33 s	0.29 s	0.28 s	0.28 s	0.27 s
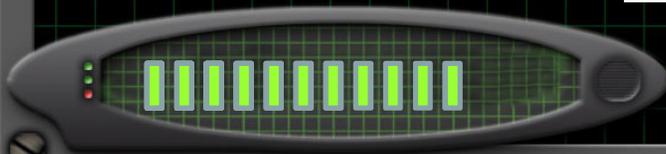
Real Time radiosity
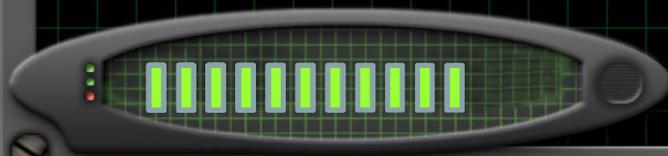
Real Time radiosity
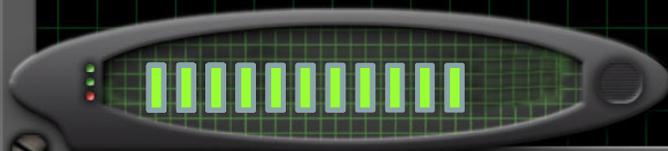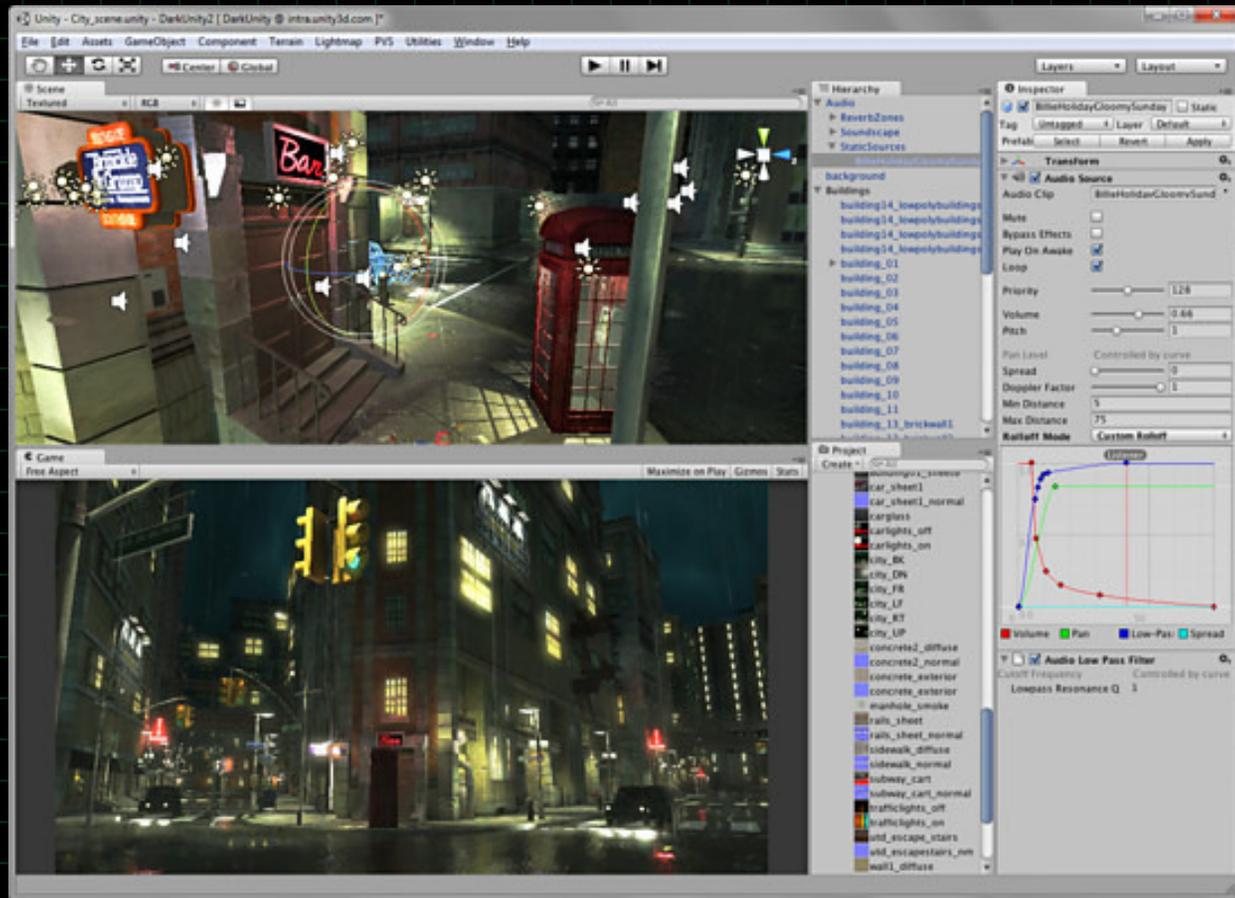
Computação Gráfica

Física

Some particles in a bowl
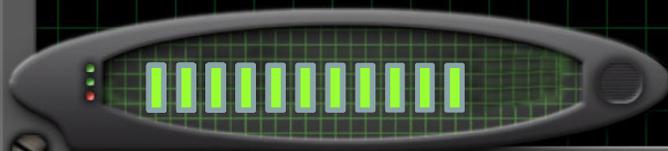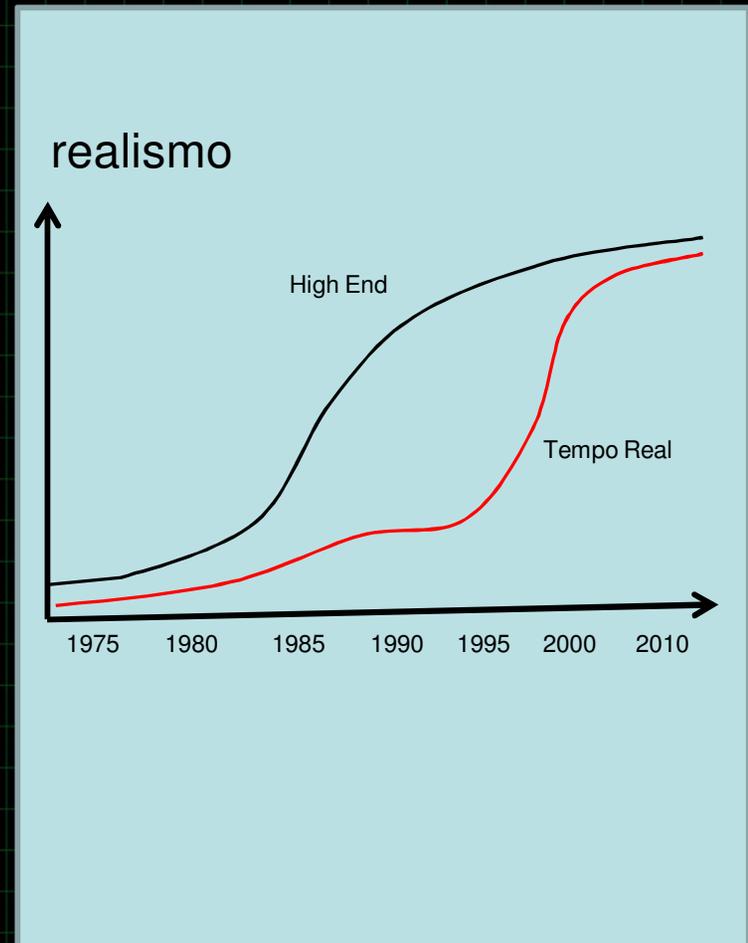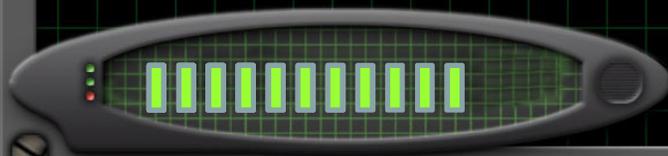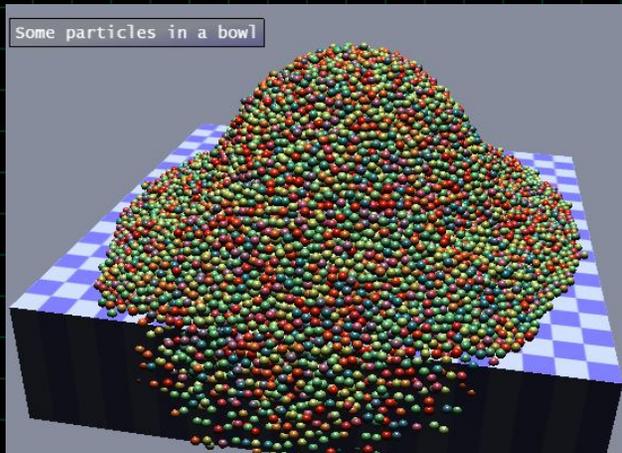
Física – corpos flexíveis

MotorStorm © 2005 Sony Computer Entertainment Europe
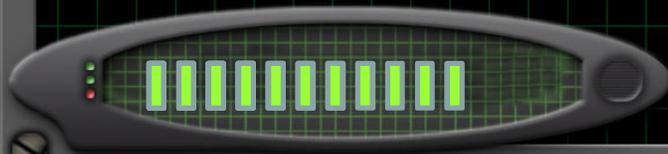
Física – fluídos
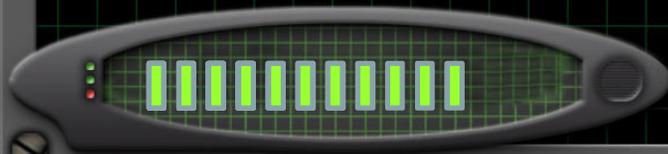
Ambientes heterogêneos entre CPU e GPU para Colisão entre corpos rígidos e fluidos
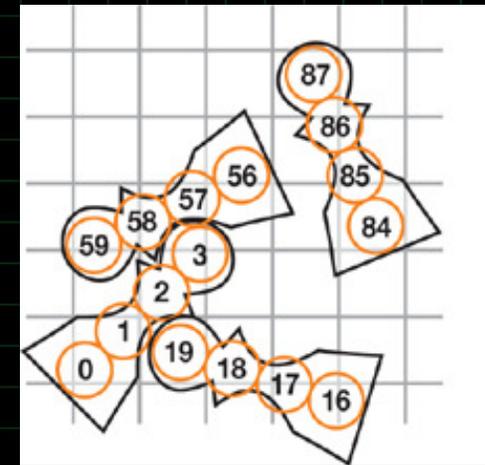
Projeto em colaboracao com DCC/UFMS
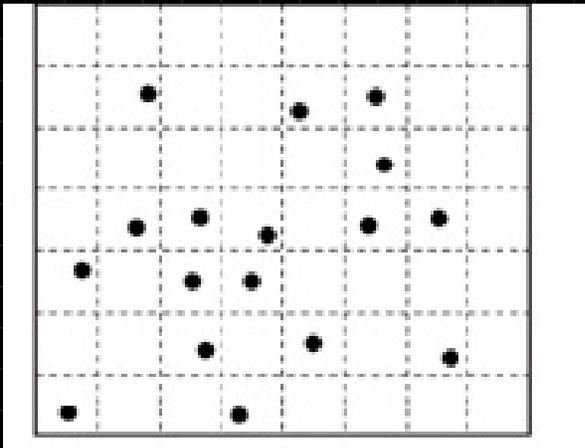
SPH Hashed Grid
Atualizada a cada frame
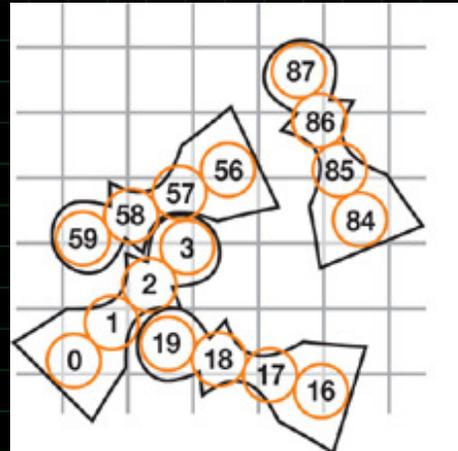
Static RB Hashed Grid
- Atualizada somente 1 vez na GPU com as posições **absolutas** das partículas dos corpos rígidos estáticos

Dynamic RB Hashed Grid
-Atualizada somente 1 vez na GPU com as posições **relativas** das partículas dos corpos rígidos dinâmicos.

- A cada frame, é atualizado somente o array de posição dos RB.

| CPU	GPU
Init_scene();	
Update_static_objects_to_GPU(); Update_dynamic_objects_to_GPU();	
	Calculate_neighborhood_particles_SPH(); Calculate_neighborhood_static_particles_RB(); Calculate_neighborhood_dynamic_particles_RB();

CPU	GPU
Broad_phase_collision(); Generate_collision_works();	Calculate_density(); Calculate_SPH_rigid_body_collisions();
	Calculate_rigid_body_forces_from_collision_works();
[In parallel] Dynamic_Rigid_Body_Integration(); Update_dynamic_objects_to_GPU();	Calculate_SPH_internal_forces(); Integration(); Calculate_neighborhood_particles_SPH();
	Calculate_neighborhood_dynamic_particles_RB();

Sound Rendering
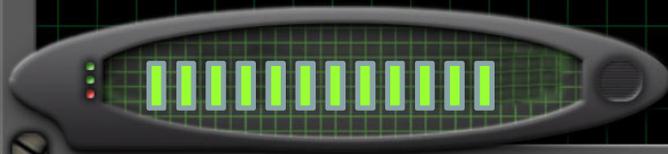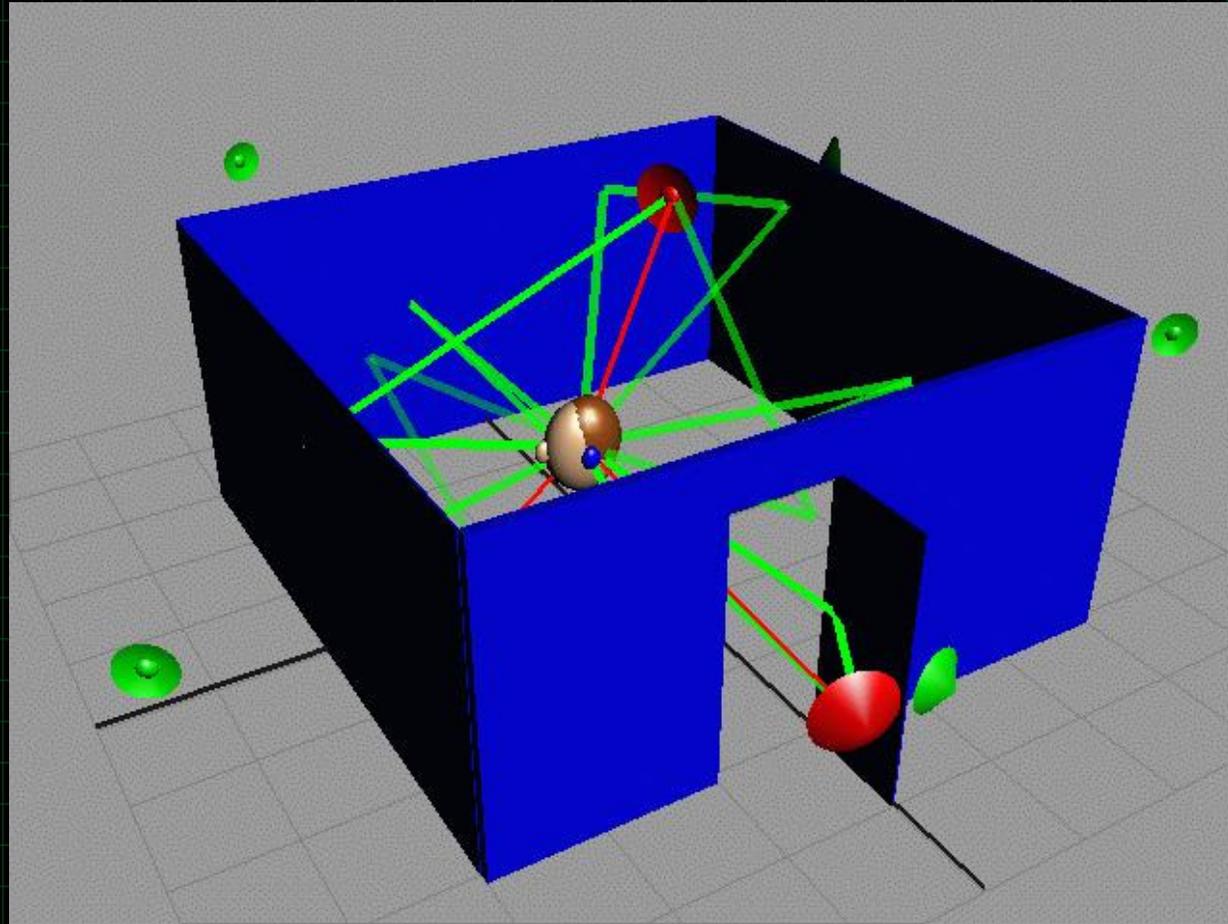
Cálculo de Propagação de Ondas

Projeto em colaboração com Petrobras/CENPES
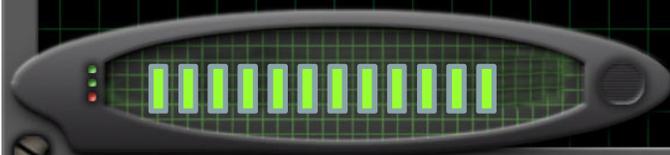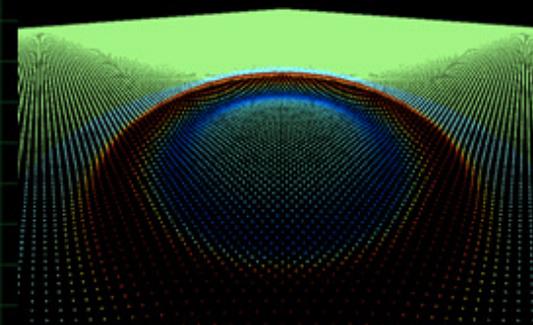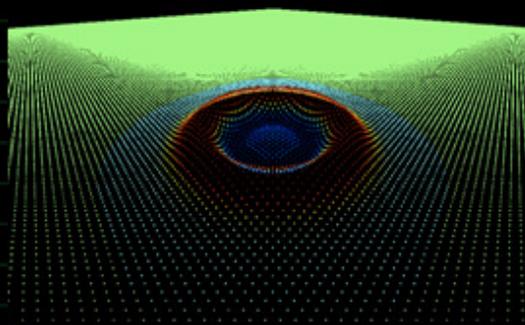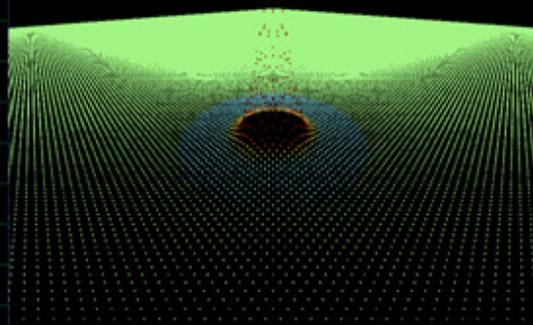
Método das diferenças finitas para simulação de ondas na GPU

- O problema: $\dfrac{\partial^2 u}{\partial t^2} = \dfrac{\partial^2 u}{\partial x^2} + \dfrac{\partial^2 u}{\partial y^2}$

- Domínio: $\Omega = [0, L_x] \times [0, L_y]$

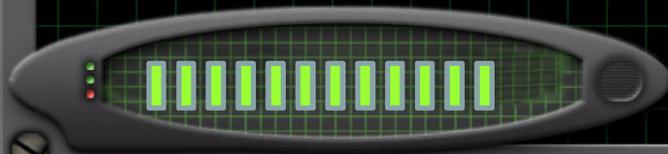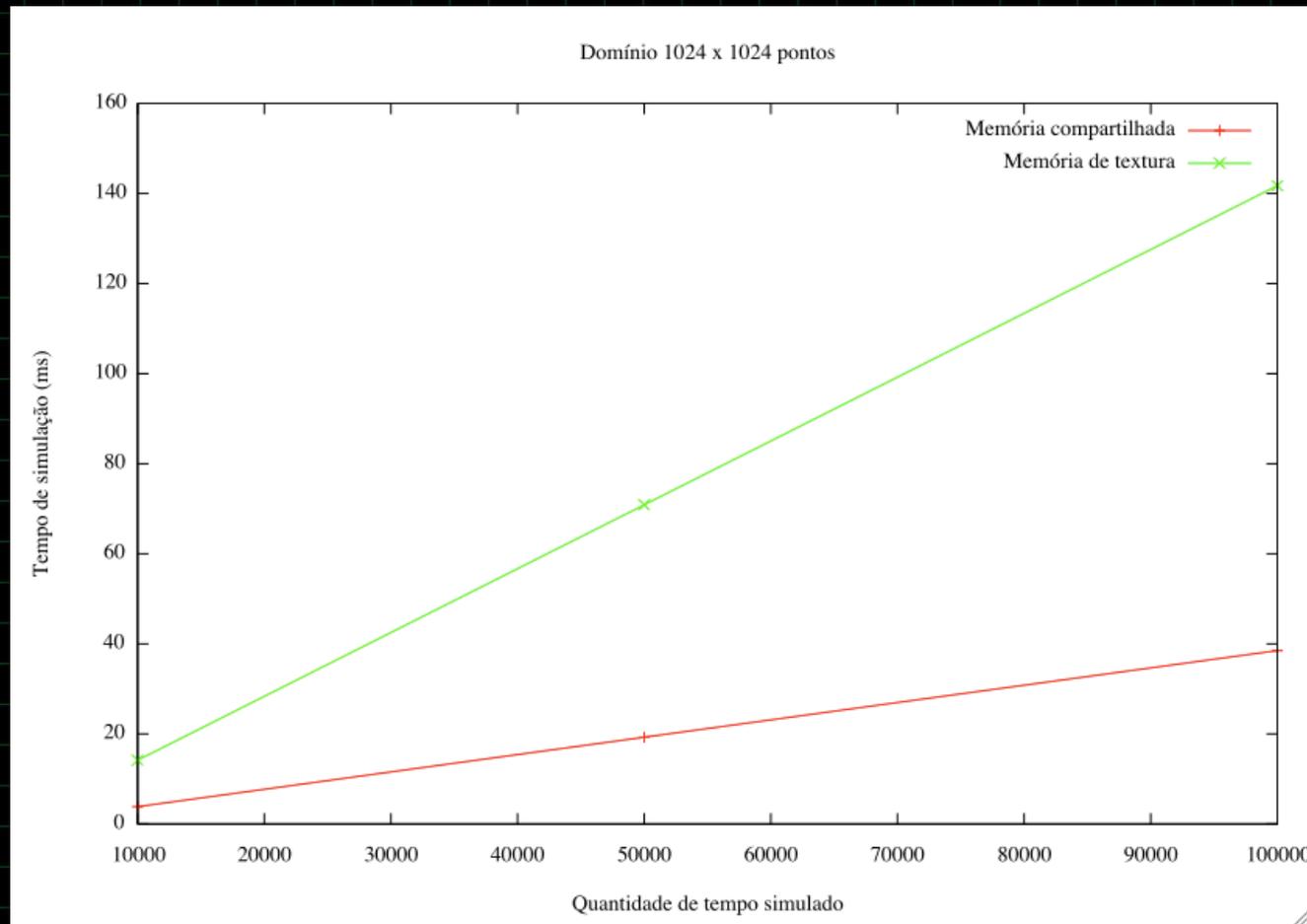- Condição inicial:
$$u(\Omega, 0) = 0$$
$$u(\Omega, 1) = 0$$

- Condição de contorno (Dirichlet):
$$u(0,0) = 0$$
$$u(L_x, 0) = 0$$
$$u(L_x, L_y) = 0$$
$$u(0, L_y) = 0$$

- Segunda ordem no tempo e no espaço e utiliza o método explícito no tempo:

$$u_{i,j}^{t+1} = \Delta t^2 \left[\frac{u_{i+1,j}^t - 2u_{i,j}^t + u_{i-1,j}^t}{\Delta x^2} + \frac{u_{i,j+1}^t - 2u_{i,j}^t + u_{i,j-1}^t}{\Delta y^2} \right] + 2u_{i,j}^t - u_{i,j}^{t-1}$$

Método das diferenças finitas para simulação de ondas na GPU

Domínio 1024 x 1024 pontos
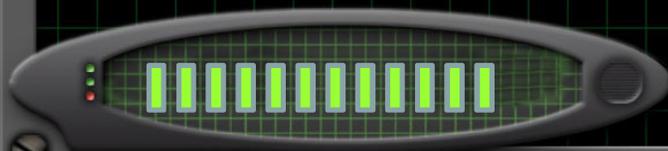
Condições de Contorno
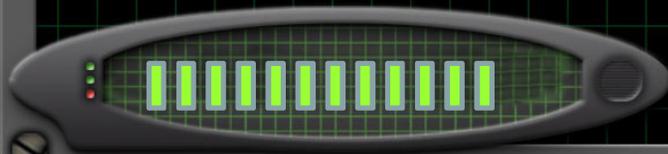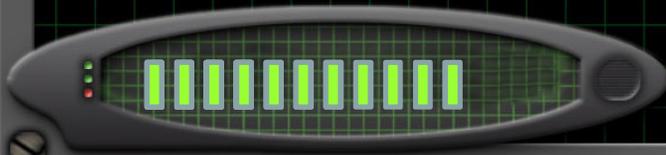
Mas não quer dizer muita coisa...

Necessidade de animação

Eu acredito

Eu não acredito

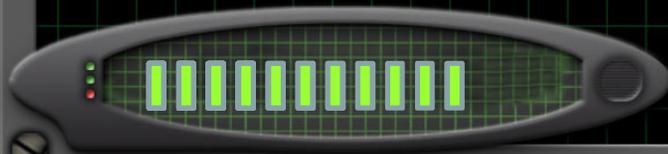Grau de fidelidade da modelagem
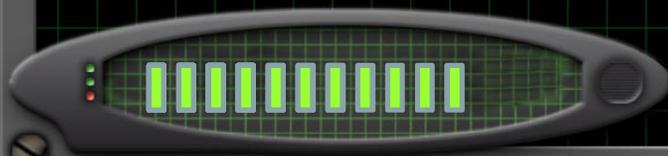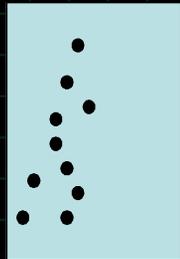
A matemática da Emoção
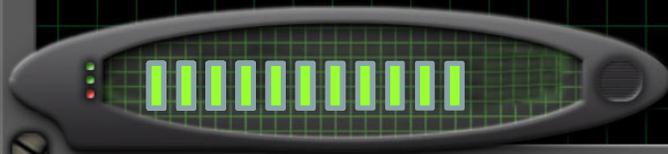
Cameras Cinematográficas

MotorStorm © 2005 Sony Computer Entertainment Europe
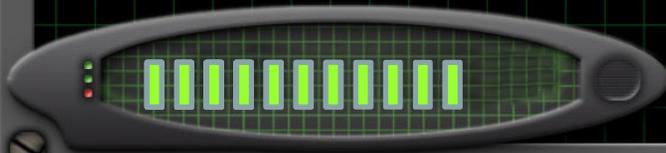
Storytelling

Planed Based x Emergent Based

- Enredo
- Personagens
- Dramatização
- Composição
- Análise
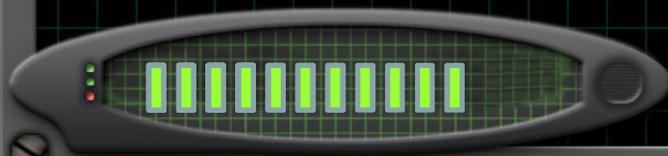
Storytelling usando redes PNF

Projeto em colaboração com Camera Culture – MIT , PUC-Rio, Unirio e DCC UFSM

Trecho onde chapeuzinho encontra o Lobo no bosque
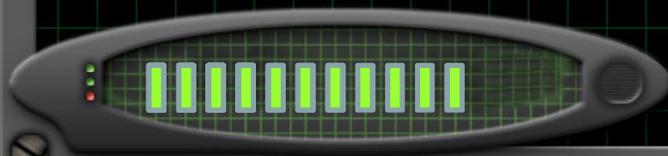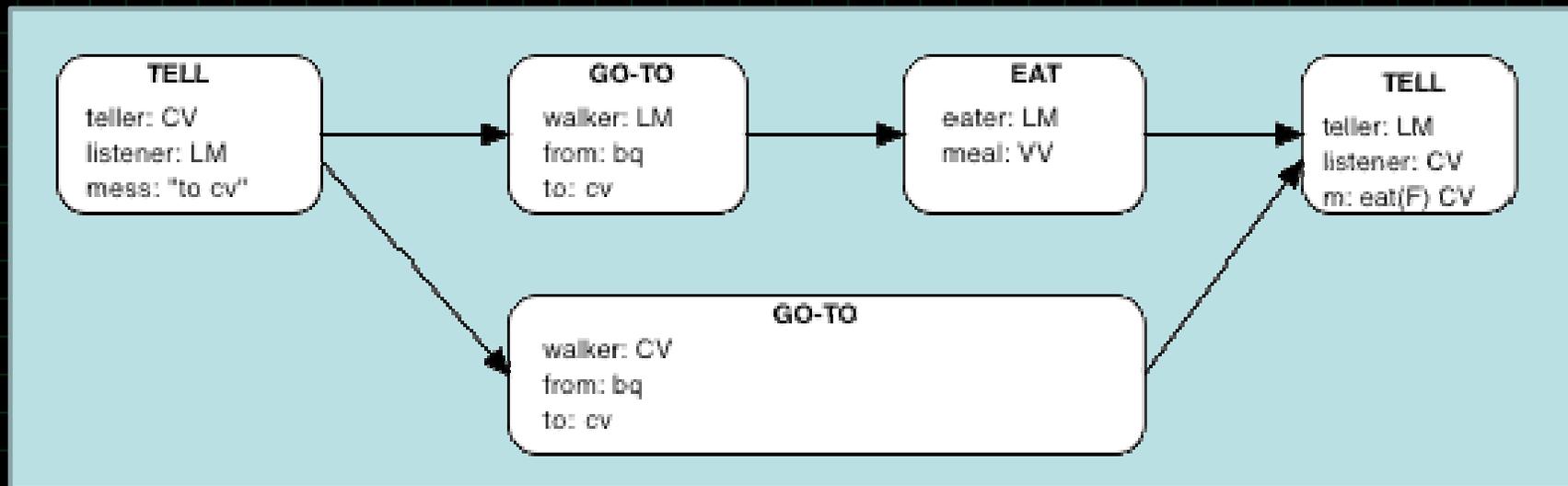
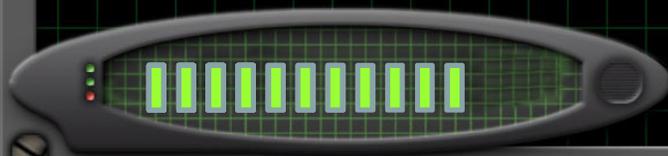# Storytelling usando redes PNF

Álgebra de Intervalos de James Allen

Storytelling usando redes PNF

Storytelling usando redes PNF

Storytelling usando redes PNF

Eventos	Chapeuzinho Vermelho		Lobo	
	Felicidade	Tensão	Felicidade	Tensão
Início	10	0	0	5
CV Meets LM	---	5	---	10
CV Go-to cv	---	0	---	---
LM Go-to cv	---	---	---	5
LM Eats VV	---	---	5	10
Tell "eat(F)"	0	10	---	---
...	...	...	...	...
CC Kill LM	5	5	--	---
CC Take-out VV	10	0	---	---
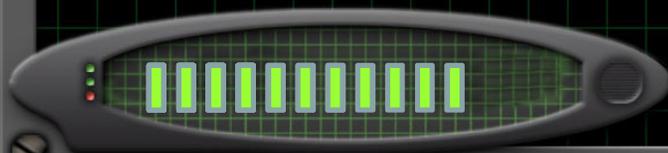
Multidão
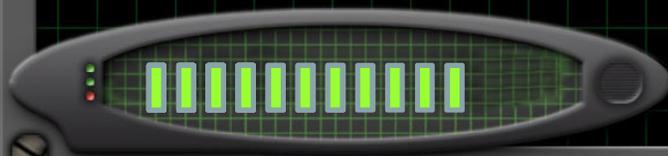
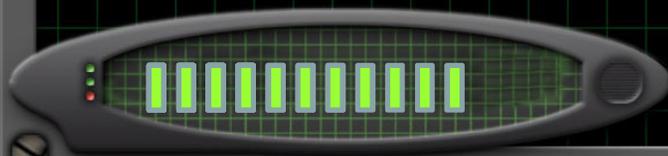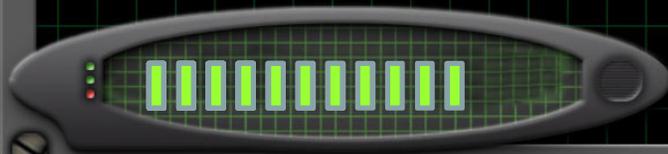# *Modelagem de Agentes em GPUs*

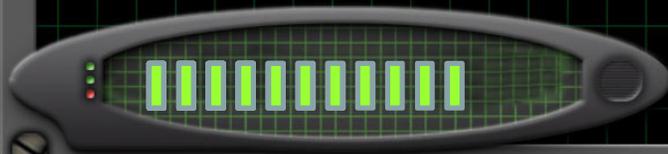
video

Modelagem de Agentes em GPUs

- A checagem sobre quais partículas influenciam as outras (vizinhança) geralmente implica em complexidade seqüencial $O(n^2)$;

- Nesta proposta não se usa uma subdivisão espacial para o ambiente
  - As entidades são diretamente armazenadas em uma grid que representa uma vizinhança topológica aproximada
  - Uma ordenação sobre os três eixos mantém a organização da vizinhança
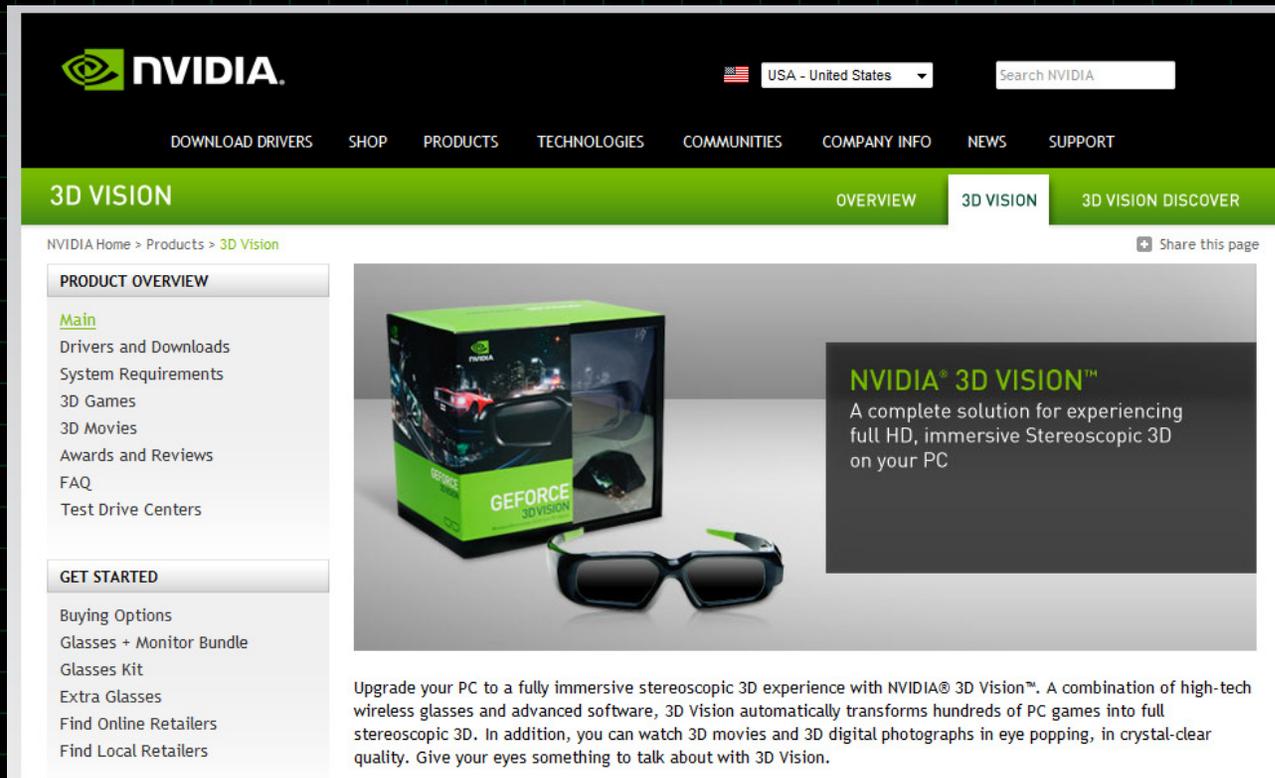 - O comportamento de um boid é modelado na base de um agente

Modelagem de Agentes em GPUs

- Passo 1: ordenação
  - Coloca a grid de vizinhança de forma correta

- Passo 2: atualização da simulação
  - Aplica as regras de comportamento da multidão e executa os agentes baseado em modelagem de threads

- Passo 3: renderização

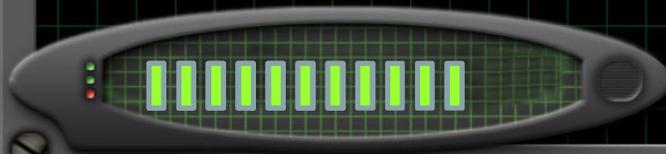Resultados com até 1,000,000 entidades interativas em tempo real [video]

Dispositivos 3D

Dispositivos 3D

Sony estreia TV em 3D no próximo ano

Reuters

Quinta-feira, 03 de setembro de 2009 - 07h01

1 Comentário(s)

Reuters

Produtos da Sony expostos na sede da empresa em Tóquio: PCs Vaio serão compatíveis com a nova tecnologia.

TÓQUIO - A Sony planeja lançar TVs que exibem imagens em três dimensões no próximo ano, publicou o Financial Times.

O CEO da Sony, Howard Stringer, anunciará o lançamento de TV 3D, assim como planos de tornar PCs Vaio, PlayStation 3 e players de Blu-ray compatíveis com a tecnologia durante a feira IFA, que acontece em Berlim, segundo o jornal.

retweet

RSS

ENVIE

IMPRIMA

ESPALHE

Leia também:

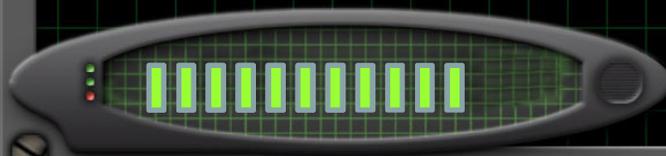O Financial Times afirmou ainda que Stringer dirá à audiência: "Assim como a

Tags:

Sony

# www.nvidia.com/object/3D_Vision_3D_Games.html

3D Games

NVIDIA 3D Vision Game Support

NVIDIA® 3D Vision™ automatically transforms hundreds of PC games into full stereoscopic 3D right out of the box, without the need for special game patches. By leveraging The Way It's Meant to be Played™ program and its close relationships with game developers, NVIDIA® provides a terrific 3D gaming experience.

The following list is all current games supported by NVIDIA 3D Vision in the latest v1.11 CD Drivers (3D Vision v190.62).

Rating	Games
Excellent	1701 A. D.
	1701 A. D.-The Sunken Dragon expansion pack
	3D Pong
	Age of Empires 3
	Age of Empires 3 - Asian Dynasties
	Age of Empires 3 - The War Chiefs
	Age of Pirates 2: City of Abandoned Ships
	Alien vs Predator 2
	Alvin and the Chipmunks
	Armed and Dangerous
	Assassin's Creed
	Attack on Pearl Harbor
	Backyad Baseball 2005
	Batman: Arkham Asylum
	Battlefield 2
	Battle Forge
	Bee Movie - The Game
	Beijing Olympics
	Beowulf
	Biohazard 5
	Black and White 2
	Blazing Angels 2 - Secret missions of WWII
	Boarder Zone
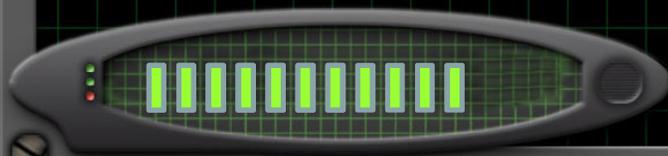
Cloud Computing

onLive®

GAME SERVICE   ABOUT US   PARTNERS   NEWS & MEDIA   BETA SIGN UP

GAME SERVICE

Games On Demand

Hot New Games!

OnLive MicroConsole™

How OnLive Works

FAQ

Beta Program

COMING SOON
WINTER 2009

SIGN UP FOR OUR NEWSLETTER

Email: [   ] SUBMIT

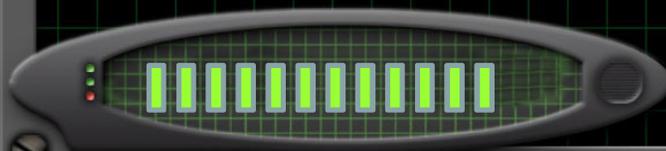**GAMES ON DEMAND**

THE onLive® GAME SERVICE
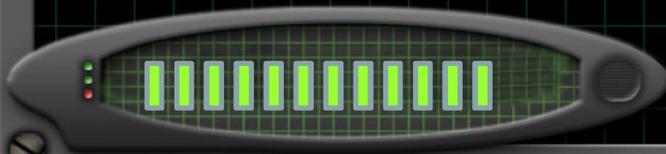ANY GAME. ANYTIME. ANYWHERE.

Arena   Profile   Games

Showcase   onLive   My Stuff

Last Played   Brag Clips   Friends

PC
via
browser plug-in

MAC
via
browser plug-in

TV
via
OnLive MicroConsole

trailer

Visão computacional

Poder para o Povo...

www.udk.com

Poder para o Povo...

www.udk.com
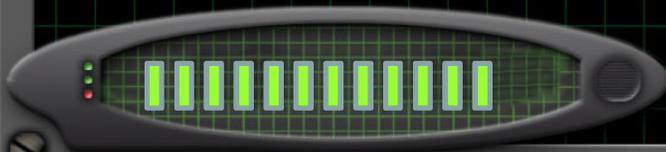
Poder para o Povo...

www.unity3d.com

Poder para o Povo...
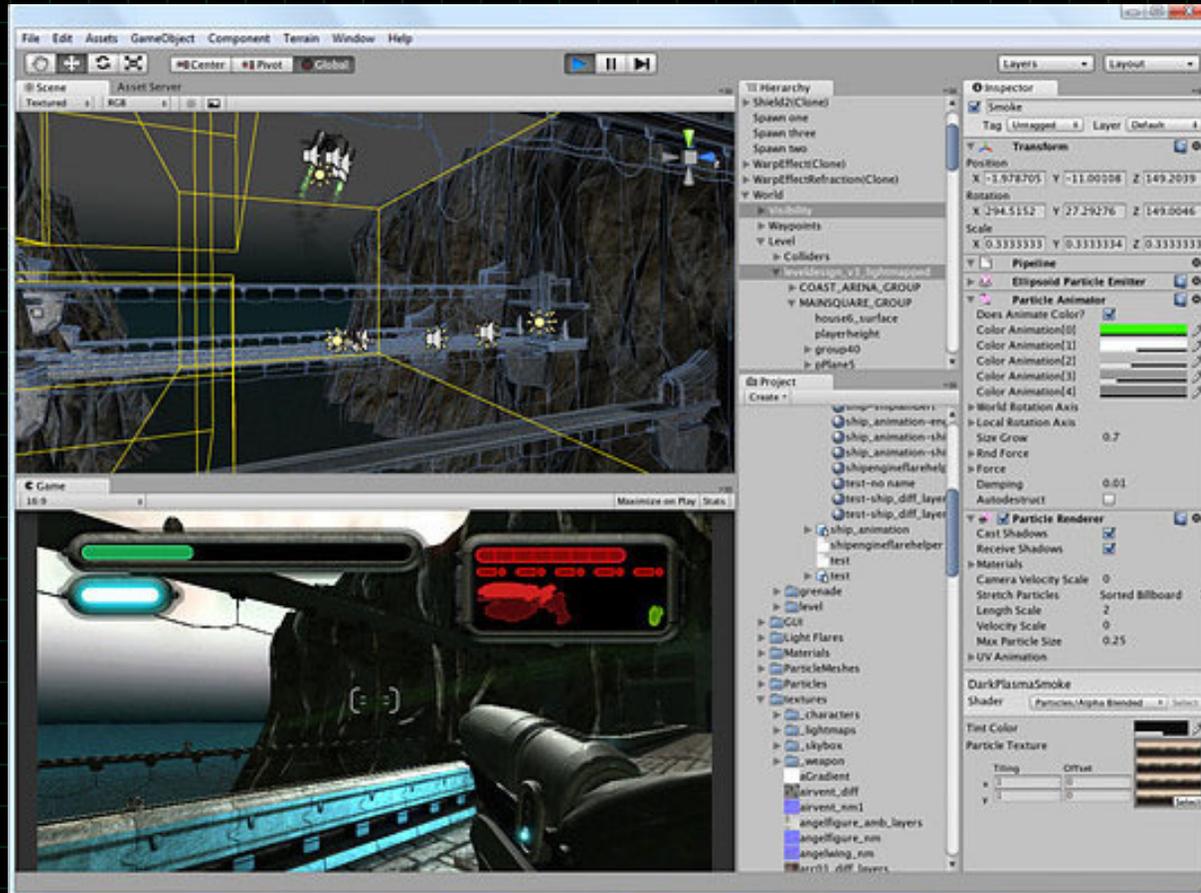
www.unity3d.com

esteban@ic.uff.br