

Computação Visual e suas Aplicações

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IMPA

Motivação

- *Computação Visual*
 - Nova Área
 - Instância de uma Tendência
 - Relacionada com várias áreas
- Matemática Aplicada Computacional
 - Quais são as Metodologias
 - Como se insere em um contexto maior

Paradigma dos 4 Universos



- *Níveis de Abstração* (Gomes and Velho, 1995)

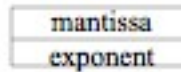
Exemplo: Numeros

Quantidades Escalares comprimento, área

Números Reais 7.598

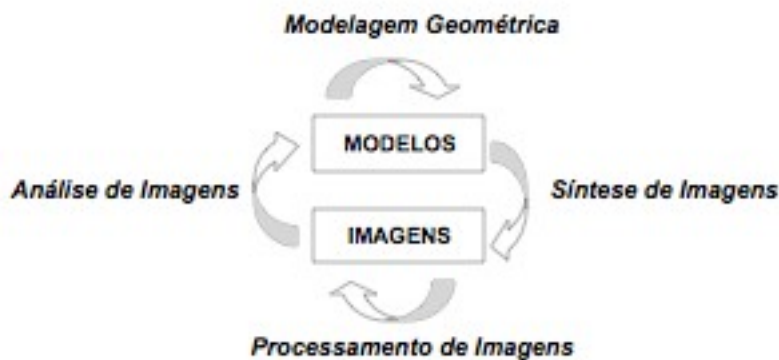
Representação de Ponto Flutuante $7598 * 10^{-3}$

Padrão IEEE

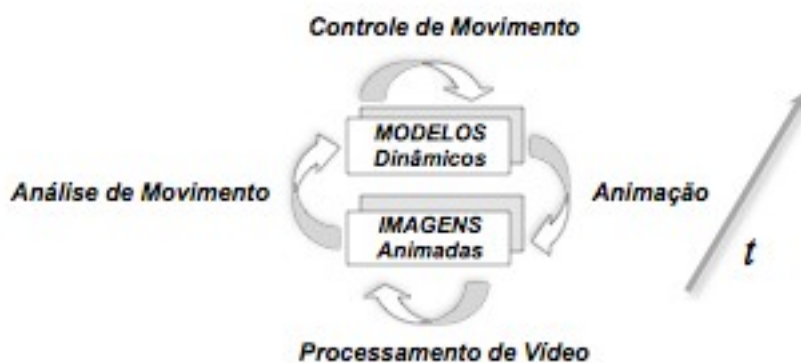


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Computação Visual



Incluindo a Variável Tempo...



OBS: Objetos dinâmicos

da *Computação Gráfica* para *Novas Mídias*

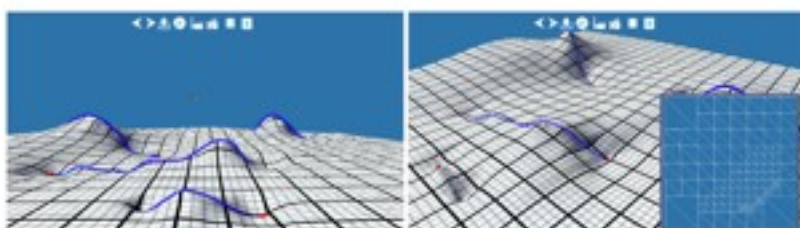
(alguns projetos recentes - 2009 / 2012)

Computação Gráfica

- Modelagem de Terreno
- Simulação da Iluminação

Modelagem de Terreno

- "Sketch-Based Free-Form Modeling of Terrain"
Adrien Bernhardt, Ph.D. (INRIA)



Traços + Eq. de Poisson

Computação em CPU / GPU

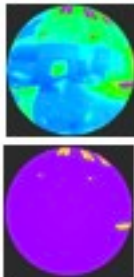


Iluminação Fotorealista

- "Hybrid Scheme for Photorealistic Rendering with Light Maps"
Aldo Zang, M.S. (2009) - best dissertation award



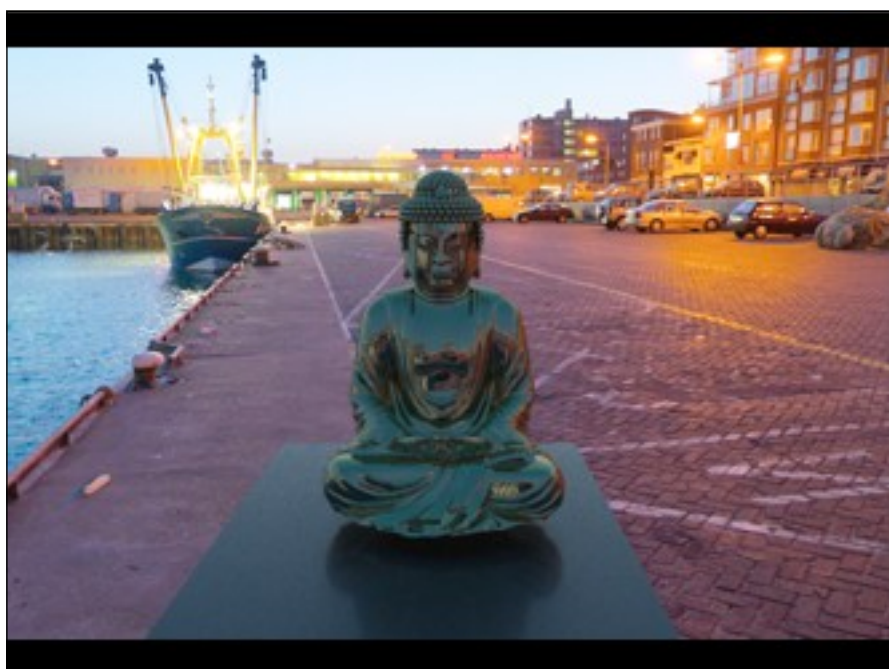
Coletor de Iluminação



Mapa Dual



Imagem Sintética





Mídia

- Imagens Panorâmicas
- Coreografia e Dança
- Música

Projeto N-Pan

- Panoramas Gigapixel e Narrativas
 - Colaboração IMPA / ESDI
- Objetivos:
 - Avançar a Tecnologia
 - Explorar Novas Mídias
 - Testar Sistemas de Autoria

Sistema de Autoria

- "PanoSuite - A Production Pipeline for Panoramas"
Rodolfo Schulz - Digitok (2009)



PanoStitch



PanoView



PanoAuthor

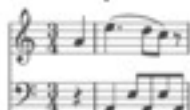


Coreografia

- "Motion Capture Based Framework for Group Dance Creation"
Adriana Schulz, M.S. (2011)



Dance



Music



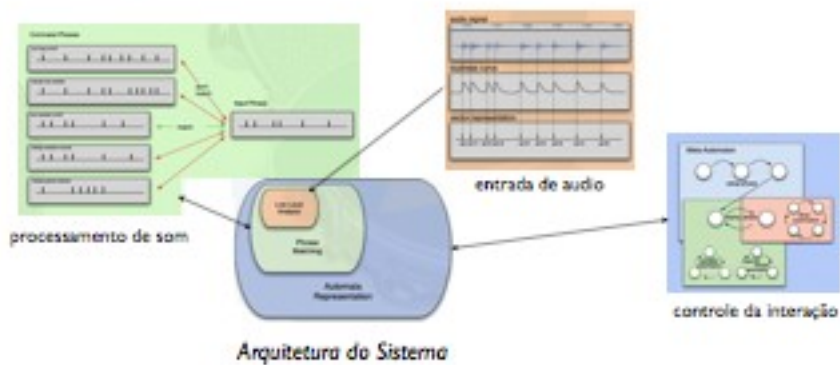
ChoreoGraph

EXAMPLE

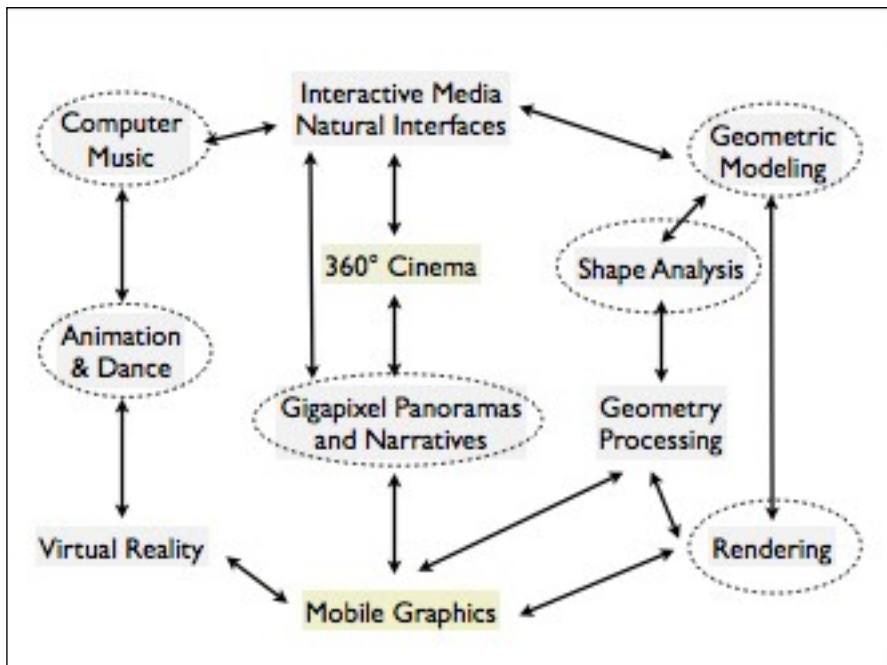


Musica

- "Rhythm-Controlled Automata Applied to Musical Improvisation"
Sergio Krakowski, Ph.D. (2009)



Pandeiro Funk: Experiments on Rhythm-Based Interaction



para saber mais

Visgraf Vision and Graphics Laboratory
Mathematics, Art, a bit of Technology ... and a lot of Passion

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The **VISGRAF Lab** was created in 1989 with the purpose of developing research in Computer Graphics at the Institute of Pure and Applied Mathematics. The project develops activities in three different and interconnected areas: education, research and development.

The Laboratory is supported by the funding agencies FAPESP, CNPq and FAPERJ and also by gifts from the companies IBM, Brasil, Autodesk, Mas and Nokia. We maintain technological partnerships with Intel and Google.

We have an ongoing collaboration with the following groups: Matemática/CIC-UFPA, TeCGraf/UFSCar, UCC/Unesp, UFPA. We also have international cooperation projects with University of Guelph (Guelph, Canada) and Hong Kong Polytechnic.

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Perguntas ?

VISGRAF 21 Anos