Virtual reality is the only effective weapon against causality.
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Bilateral Blue Noise Sampling
Jiating Chen, Xiaoyin Ge, Li-Yi Wei, Bin Wang, Yusu Wang, Huamin Wang, Yun Fei, Kang-lai Qian, Jun-hai Yong and Wenping Wang.

Research on GPU Acceleration of Incompressible Smoothed Particle Hydrodynamics and Applications

Point-Tessellated Voxelization
Yun Fei, Bin Wang, and Jiating Chen.

FILM CREDIT

Alita: Battle Angel
https://www.imdb.com/name/nm10481123/

OPEN SOURCE REPOSITORIES

CreamyStrand
https://github.com/nepluno/creamystrand
An open source project for the physical simulation of the coupling between hairs and shear-dependent liquid, which contains the following parts:
- A strand simulator adapted from the code of ADONIS (http://www.cs.columbia.edu/cg/adonis/), which adopts discrete elastic rods and nonlinear integration to simulate hairs.
- A bulk liquid simulator for both shear-dependent and Newtonian liquid, discretized with augmented, moving least squares material point method (AMLS-MPM).
- A reduced-dimensional flow simulator that handles shear-dependent liquid on a strand’s surface.
- A framework coupling the dynamics between strands, the bulk liquid, and reduced-dimensional flows.

libWetCloth
https://github.com/nepluno/libwetcloth
An open source project for the physical simulation of liquid and wet cloth or yarns, which contains the following parts:
- A liquid simulator implementing the affine-particle-in-cell method.
- A cloth simulator implementing the elastic thin shell model.
- A yarn simulator implementing the discrete viscous thread model.
- A cloth/yarn collision handler based on anisotropic elastoplasticity, discretized with augmented, moving least squares material point method (AMLS-MPM).
- A two-way coupling method based on mixture theory, between the cloth, yarn and liquid, handling dragging, buoyancy, capturing and dripping effect.

libWetHair
https://github.com/nepluno/libWetHair
An open source project for the physical simulation of Newtonian liquid and wet hairs, which contains the following parts:
- A liquid simulator implementing the affine-particle-in-cell method.
- A hair simulator implementing the elastic rods model.
- A reduced-liquid simulator for the simulation of flow on hairs.
- Cohesion effects between the hairs
- Coupling between the hairs and liquid, including dragging, capturing and dripping effect.
Note: The code in this repository has been re-implemented for Alita: Battle Angel (and possibly more movies) made by Weta Digital.

L-BFGS-B-GPU
https://github.com/nepluno/lbfgsb-gpu
An open source project implementing the limited memory Broyden-Fletcher-Goldfarb-Shanno algorithm with boundaries (L-BFGS-B) on the GPU. L-BFGS-B is a popular algorithm in nonlinear optimization, which is also at the heart of many algorithms in engineering. In this repository, a parallelized implementation of L-BFGS-B on the GPU is introduced, where we demonstrate its significant speed-up for practical applications.

SPH-Lloyd-3D
https://github.com/nepluno/sph-lloyd-3d
The repository contains C++ code and GPU shaders that perform Lloyd’s relaxation for point sampling inside given 3D meshes. This functionality is often used for preparing data for physics simulations using particles.

APIC2D
https://github.com/nepluno/apic2d
An educational project to illustrate the affine-particle-in-cell algorithm in 2D, for water simulation.

BilateralBlueNoise
https://github.com/nepluno/bilaterallbluenoise
This repository demonstrates the dart throwing and kernel-based relaxation of bilateral blue noise sampling on the GPU. Such sampling pattern is helpful for producing smooth rendering of caustics or accurate surface reconstruction.
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PROFESSIONAL SERVICES

- Paper Reviewer, SIGGRAPH Asia 2019
- Paper Reviewer, SIGGRAPH 2019
- Paper Reviewer, SIGGRAPH Asia 2018
- Paper Reviewer, SIGGRAPH 2018
- Paper Reviewer, Eurographics 2020
- Paper Reviewer, Pacific Graphics 2019
- Paper Reviewer, Pacific Graphics 2018
- Paper Reviewer, Pacific Graphics 2017
- Paper Reviewer, ACM Transactions on Graphics
- Paper Reviewer, Computer Animation & Virtual Worlds
- Paper Reviewer, Graphics Model
- Paper Reviewer, CAD/Graphics

SKILLS

Experienced with both fast prototyping and industrial development involving millions of lines of code. Comprehensive understanding of C/C++, Python, OpenGL/DirectX/Vulkan and CUDA/OpenCL programming; ample experience with deep learning and TensorFlow; familiar with JavaScript, HTML5, WebGL, Java, Assembly and C#.

HONORS AND AWARDS

- Teaching Assistant Fellowship, Columbia University, 2014—2015.
- Excellent Graduation Thesis in Tsinghua University ranked 1st in department, 2013.
- Winning Prize in NVIDIA CUDA Programming Contest, 2012.
- Student Research Competition Semi-finalist Star in ACM SIGGRAPH 2012.
- 2nd Scholarship in Tsinghua University, 2009.
- 2nd Prize in the Great Challenge Champion in Tsinghua University, 2009.