Rafael Campos

3D Graphics Software Engineer

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github.com/campos-rafael

Experience

Senior R&D Software Engineer at *Blizzard Entertainment* December 2020 – Current
Irvine, CA

- Development of CG tools for Effects in Maya and Houdini, and for Lighting and Rendering in Katana.
- Responsible for supporting the Lighting Dept. in using Redshift and Pixar's Renderman from Houdini & Katana.
- Development of render procedurals, render plugins, and nodes and operators for Katana.
- Creation of a crowd interface between Golaem, Blizzard custom assets and Katana, used in Diablo IV Cinematic.
- Fluid simulation development (thin sheet preservation, particle reseeding).
- Highly-optimized rigid align tools for Houdini.

Software Engineer at *Rooster Teeth Animation* Jan 2020 – Dec 2020
Austin, TX

- Python and C++ software tools development to support Animation Production using the Maya API.
- USD prototyping and experimentation for adoption in production.
- Unreal Engine 4 Plugin Development in C++: mesh preprocessing and compatibility layer with Maya.
- C++ physics-based spring animation system in Maya for hair and cloth animation with Python bindings (Boost.Python).

Graphics R&D Software Developer at *Framestore* Sept 2016 – Sept 2017
London, UK

- Worked on extending and maintaining the in-house fluid simulation tool, fLush (a fork of Naiad).
  - Added collider instancing support for more efficient memory usage.
  - Introduced artist-friendly force fields to affect the simulation, with Maya OpenGL viewport icons.
  - Created a Geometry Spreadsheet in Qt to allow for inspection of particle and volume fields.
- Trained FX TDs and non-technical artists on how to work with the fluid simulation software.
- Screen credit on Alien: Covenant (Ridley Scott, 2017).

R&D FX Software Developer Intern at *DreamWorks Animation* May 2015 – Aug 2015
Glendale, CA

- Developed a Houdini plugin for fluid self-advection with OpenVDB.
- Implemented geometry deformation tools using polygon warping and volumetric morphing algorithms.
- Created and deployed installer scripts for OpenVDB on the homebrew (brew.sh) infrastructure for Mac OS X.

Software Developer at *Credit Suisse* Jan 2010 – April 2013
São Paulo, Brazil

- Banking and fixed income trading software development in C#, SQL Server and .Net technologies on a Microsoft Windows platform using Visual Studio.

Education

PhD in Computer Science and Computational Mathematics at the *University of São Paulo* 2017 – 2025
São Paulo, Brazil

- Physical simulation research on physically-based animation, advised by Prof. Afonso Paiva.

- Thesis topics:
  - Cloth Simulation and numerical methods for partial differential equations - finite elements and finite volume method.
  - Constitutive modelling and rigid body dynamics, using Nvidia PhysX and custom solutions in C++/MPI.
  - Multigrid methods for the solution of large-scale linear systems.

MSc. in Computer Science at *Drexel University* 2014 – 2016
Philadelphia, PA

- BSMP Fulbright Scholarship for Graduate Study Recipient.
- Emphasis on Computer Graphics.
- Thesis on Volumetric Morphing with Level Sets under supervision of Prof. David Breen in collaboration with Dr. Ken Museth (Nvidia).

BEng. in Computer Engineering at the *Federal University of São Carlos* 2005 – 2013
São Paulo, Brazil

- Emphasis on Software Engineering.
- *Google Summer of Code 2013 grant*: Implemented early OpenVDB support in Blender.
- *Student volunteer* at Siggraph 2009 in New Orleans, LA.

Publications

RBF liquids: an adaptive PIC solver using RBF-FD November 2020
ACM Transactions on Graphics (TOG) | Siggraph Asia 2020
Rafael Nakanishi, Filipe Nascimento, ***Rafael Campos***, Paulo Pagliosa, Afonso Paiva
10.1145/3414685.3417794

Parallel isogeometric boundary element analysis using subdivision surfaces with adaptive refinement on CUDA December 2024
Preprint
Bárbara Munhão, ***Rafael Campos***, Márcio Peres, Afonso Paiva, Paulo Pagliosa

Technologies

Languages: Modern C++, C, Python, Lua, GLSL, CUDA, OpenCL

Technologies: Maya API, Houdini HDK, Katana SDK, OpenUSD, OpenVDB, OpenSubdiv, Alembic, Qt, Boost, OpenImageIO, OpenColorIO, Embree, OptiX, Redshift, Renderman, Unreal Engine, PhysX, Bullet, OpenGL, OpenMP, MPI, CUDA, OpenCL, Git, JIRA, Confluence, Perforce, Shotgun, Jenkins, Travis CI, CMake, Visual Studio, Xcode, Linux, Windows, Mac OS X