

PER KARLSSON

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EDUCATION

B.Sc in Media Technology and Engineering, GPA 4.0/4.0

M.Sc in Computer Science and Engineering, GPA 3.9/4.0

Linköping University, Sweden and Stanford University, USA.

EXPERIENCE

Software Engineer

Pixar Animation Studios

2012-Present

Technical Director

Emeryville, CA

Co-authored the rigid body simulation pipeline built on top of existing *bullet* and *Physbam* rigid body libraries, developing the C++ backend and the python wrapped frontend. This system is used for all rigid body simulations in the Pixar inhouse animation system.

In production, worked on the feature movies - *Finding Dory* where I set up tetrahedral finite elements simulation for a main character and fluid based simulations for underwater particles. *The Good Dinosaur* where I led the vegetation simulation effort in the context of character interaction. *Inside Out* where I authored a new tool for animators to simulate secondary motion on top of hand-animated primary motion, saving them the time and effort of having to manually animate such effects.

Software Engineer

Naiad Group at Exotic Matter
Stockholm, Sweden

2011

Developed the Naiad Ocean Toolkit, a frequency spectrum based wave generator. The wave simulation generated by the toolkit can be merged with an existing Naiad FLIP water simulation, enabling visual effects studios to exclusively use Naiad for ocean sequences. I also wrote 3rd party Naiad plugins for Houdini and the Arnold renderer, allowing studios to use Naiad in their pipelines without any additional development work.

Teaching Assistant

Linköping University

2009-2010

Lecturer in single variable calculus and linear algebra. Grading assignments.

SKILLS

Extensive knowledge of simulation, parallel computing, real-time performance and offline rendering. Proficient programming skills in C/C++, Python, OpenGL, OpenCL, CUDA, Matlab.

OPEN SOURCE PROJECTS

gpuip - Framework for Image Processing on the GPU

<https://github.com/karlssonper/gpuip>

C++/Python cross-platform framework simplifying the image processing pipeline on the GPU and makes it more generic across the three most common environments: OpenCL, CUDA and OpenGL GLSL. It provides a simple interface for GPU data transfer and makes it easy to compile and execute GPU kernels. Used for research by the *Computer Graphics and Image Processing Group* at Linköping University.

HONORS AND AWARDS

1st Prize in the Rendering Competition, *Stanford cs348b*, 2012

Global illumination model for rendering foam and splashes.

Most Technical Advanced Game Award, *Stanford cs248*, 2012

GPU based Ocean Waves, Deferred shading with Depth of Field, Motion Blur and Bloom.