

# Joel Gross

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## Projects

### Fluid-Cloth Two-Way Coupling

SPRING 2015

Extends the fluid simulation project below to also support cloth, similar to NVIDIA's FleX framework. Particles of different types are able to interact seamlessly within the framework, all in real-time at interactive framerates. The cloth implementation is primarily based on "Position Based Dynamics" (Mueller 2006).

### Fluid Simulation

FALL 2014 — SPRING 2015

Simulates fluid and foam particles with realistic motion in real-time. Written from scratch using CUDA, C++, and OpenGL. Implements many different research papers resulting in a framework capable of running 50k fluid particles and up to 500k foam particles at 10-15 fps. The primary resource for the fluid physics is "Position Based Fluids" (Macklin 2013).

### Deferred Shading Engine

SPRING 2015 — CURRENT

Developing a 3D puzzle-action game in C++ and OpenGL, working in a team of 6. Lead Programmer and personally responsible for developing the rendering engine being used in the game. Features currently implemented or under development include an Octree data structure for fast spatial partitioning, screen-space ambient occlusion, depth of field, and various lighting effects.

### Thermo

FALL 2014

Developed a puzzle-platformer using Actionscript 3 in a team of 6. Personally responsible for game direction, gameplay programming, and art. Played by over 50k people across Newgrounds and Kongregate. Featured as a top game on Jayisgames.com.

## Work Experience

### Course Assistant — Computer Architecture

FALL 2013

Assisted with course projects, tutored students during study sessions, and held weekly office hours for a class of 60.

## Education

### Cornell University

FALL 2014 — SPRING 2015 (EXPECTED)

Graduate School  
M.Eng — Computer Science

### SUNY Binghamton University

FALL 2011 — SPRING 2014

GPA: 3.67 — GRADUATED IN 3 YEARS

Watson School of Engineering  
BS — Computer Science

Harpur College of Arts & Sciences  
BS — Economics

## Honors

### Academic Honors

Watson School of Engineering

CUM LAUDE

Harpur College of Arts & Sciences

CUM LAUDE

Dean's List • SPRING 2012, FALL 2012, SPRING 2013, FALL 2013

## Skills

### Programming

Java • FLUENT, 6 YEARS

C++ • FLUENT, 4 YEARS

C • FLUENT, 4 YEARS

Python • FAMILIAR, 3 YEARS

Actionscript 3 • PROFICIENT, 1 YEAR

### Design

Adobe Photoshop • FLUENT, 9 YEARS

Adobe Flash • PROFICIENT, 3 YEARS

### Tools & Platforms

Linux

Microsoft Windows

CUDA

OpenGL/GLSL

Unity

Unreal Engine 4

LibGDX

Git