Kai Ninomiya

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Education

University of Pennsylvania, May 2016: Student, MSE, Computer Science. GPA: 3.96
- **Past:** GPU Programming, Physically-Based Animation, Comp. Graphics/Rendering, Adv. Topics in Graphics, Adv. Programming (Haskell), Security in Multicore Arch.
- **Current (Fall 2015):** Vision & Computational Photography, Algorithms.
- **Upcoming:** Software Foundations (Proofs/PL), Software & Distrib. Systems.

University of Pennsylvania, Dec. 2015: Student, BSE, Computer Science. CS-only GPA: 3.56
- **Selected Coursework:** Intro. Graphics, Compilers, Operating Systems, Artificial Int., Computer Architecture, Modern Physics, Modern Optics, Intro. Analog Electronics.

Work

Intern, Cesium.js, Analytical Graphics, Inc. OSS WebGL virtual globe engine. Sum. 2015
- Designed/implementated performance optimizations for streamed terrain rendering.
- Worked with Khronos 3D Formats Group on glTF format, extensions, ecosystem.

Intern, Virtual Graphics, VMware, Inc. Virtual machine guest graphics driver. Sum. 2014
- Worked toward OpenGL 3.x driver support, under Mesa creator Brian Paul.

STWing Residential Program Systems Administrator & College House Manager 2012–2015
- Administration of web/email/user servers & coordination of college house events.

Teaching

***(Planned)* Co-instructor**, CIS 199: Special Topics – Rust (½ CU mini-course) Spr. 2016
- Co-creation of curriculum, lectures, quizzes, & assignments for brand-new Rust course.

Teaching Assistant, CIS 565: GPU Programming Fall 2015

Teaching Assistant, CIS 277, CIS 560: Computer Graphics Spr. 2014–Spr. 2015

Co-instructor, CIS 191: Linux/Unix Skills (½ CU mini-course) Fall 2013
- Writing/editing lectures, quizzes, homework, projects; office hours, student advising.

Coursework

GPGPU Fracture Physics Simulation in the Browser (Nov 2014, pair, 1200 sloc): *JS, WebCL*.
CUDA Path Tracer (Oct 2014, solo, +400 sloc): Interactive. Diffuse, Fresnel effects, focal blur.

Projects (see website)

WebGL Deferred Shader (Oct 2015, solo, 700 sloc): Created from scratch as a course project for CIS 565. Online demo; high performance with >100 point light sources. *JS.*
Rusttrace (June 2014–Aug. 2015, pair, 430 sloc): Simple raytracer with lights, materials, and primitive photon mapping. Used as a learning project for the Rust language. *Rust.*
rspt (Aug.-Sep. 2015, solo, 200 sloc): Very small, very basic path tracer. *Rust.*
Elsie (Jul. 2014 onw., group, 3000 sloc): Online CPU architecture simulator/teaching tool. *JS.*
Chickens (Jan. 2011 onw., group, 3400 sloc): Networked 2D platforming game with live-editable maps. Custom OpenGL GUI library and networking framework. *C#, OpenGL.*

Publications

Ninomiya, K., Kapadia, M., Shoulson, A., Garcia, F., and Badler, N.I. "Planning Approaches to Constraint-Aware Navigation in Dynamic Environments." *Comp. Anim. Virtual Worlds*, 2014. (Previous version available on website above.) May 2013–Sep. 2014
- Path planning framework w/ multiple spatial constraints between objects and agents.
- (Previous version) Winner of the Diane Chi Summer Research Award 2013 Aug. 2013

Awards

CIS Dept. Senior Design Poster Competition – 2nd Place Winner May 2015
Oculorama: capture large real-world spaces and explore in immersive VR. *Team of 4.*

Penn Play Game Jam: "Exploration" – Best Game Design Mar. 2014
Invincible, a 2D physics-based cave exploration simulator. *Team of 2.*

International Space Apps Challenge – Best Use of Hardware Apr. 2013
ISS Base Station, Hardware/Software Public Art & Science Awareness Hack. *Team of 13.*

Skills

Computer Languages
- Proficient: C, C++, HTML/CSS/JavaScript, C#, Python, TEX, Shell, Regular expressions.
- Working knowledge: Rust, Haskell, Java, basic Verilog.

Technologies
- Proficient: Git/Mercurial, OpenGL 3.x, WebGL, Linux administration (Debian/Arch, Vim).
- Working knowledge: CUDA, CMake, jQuery, Eigen, SQL, analog circuit analysis.