

RUSSELL RYAN

Education

2005 - Present **The Massachusetts Institute of Technology** Cambridge, MA
In Pursuit of a Masters of Engineering in Computer Science GPA 4.5/5.0
Bachelors of Science in Computer Science & Engineering

2001-2005 **North Central High School** Indianapolis, IN
Graduated as Valedictorian of 630 students. SAT 1530 GPA 5.4/4.0

Work Experience

2009 **Google, Inc.** New York, NY Summer internship with the Real Estate search group in Google Maps. Redesigned a significant portion of the Real Estate data processing pipeline.

2008 **ITA Software** Cambridge, MA Summer internship with the Needle group. Aided in the design and implementation of a semantic web product to be released in 2009.

2007 **NVIDIA Corporation** Santa Clara, CA Summer internship with Direct3D Group. Tasked with investigating and debugging the NVIDIA DirectX driver for Windows XP and Vista. Also created a system to automate the testing and verification of next-generation graphics hardware in a distributed manner.

2006 **Interactive Intelligence, Inc.** Indianapolis, IN Summer internship. In charge of writing programs to judge the quality of a VoIP telephone call algorithmically.

2005 **Indiana Farm Bureau Insurance** Indianapolis, IN Summer internship. Rewrote entire Internet based automobile insurance quoting application as a pluggable rate generation module. Designed companion Spring web application for home users to generate insurance quotes online.

Skills

Languages: C/C++, Java, Python, Scheme, Ruby, Perl, PHP, Javascript, JSP, L^AT_EX, Verilog, Assembly

Technologies: GNU/Linux, DirectX/OpenGL, Qt, Win32API, TCP/IP, MapReduce, SQL, XML, jQuery, Django, JDBC, AJAX, Ruby on Rails, Spring, Hibernate, SOAP, Apache Struts/Tiles, Cryptography/Steganography, ASIC Design

Coursework: Compiler Design, Operating System Engineering, Computer System Engineering, Advanced Algorithms, Randomized Algorithms, Computer Graphics, Large-Scale Symbolic Systems, Artificial Intelligence, Computation Structures, Linear Algebra, Signals and Systems, Digital Systems Laboratory, Software Engineering Laboratory, Mobile Applications Development

Software: Perforce/CVS/SVN/BZR/Git, GNU Emacs, Visual Studio, Eclipse/Websphere, Tomcat, Apache, Xilinx ISE/ModelSim

Architectures: x86/64, AVR, PIC, Cell-BE (Playstation 3), SH-4 (Dreamcast), PowerPC

Miscellaneous: strong verbal and communication skills, excellent troubleshooting and debugging skills

Projects, Interests, and Activities

For videos, code, and pictures of my projects, go to <http://rustyryan.net/projects>

Moca: Mobile Care for Developing Nations Co-founded an open-source telemedicine project for remote diagnosis in developing nations using Android smartphones. Currently working with doctors and industry professionals to deploy in various health care clinics around the world. <http://www.mocamobile.org>

Mixxx: Digital DJ Software Core contributor to Mixxx, cross-platform open-source DJ software. In Summer 2008 (as part of Google Summer of Code) completely rewrote the visual waveform display. In 2009, redesigned a core part of the audio engine. Have participated in 2 major releases. <http://www.mixxx.org>

Blue-Steel: Playstation 3 Real-Time Interactive Raytracer Co-developed in January 2007 achieving frame rates of up to 25fps with reflection, refraction (multiple bounces), bump-mapping, functional shaders, perlin noise shaders, and recursive materials. Implemented Pong using a SIXAXIS Controller as a proof of concept. (<http://www.cag.csail.mit.edu/ps3/blue-steel.shtml>)

MIDAS: Multi-Function In-Dorm Automation System Co-designed dorm automation system complete with lights, music, automated blinds, and various modes, such as sleep mode, work mode, and party mode. (<http://web.mit.edu/zacka/www/midas.html>) Was written up on Slashdot and Digg.

Solace Engine DirectX 3D rendering engine capable of loading and displaying Quake 3 world maps and models. Supports Vertex and Pixel shaders.

Subterranea Engine Software 3D rendering engine capable of loading and displaying Quake 3 world maps and models.

MIT 6.170 Award Won Best Usability for final project in MIT's software engineering lab.

Website Design Design and operate multiple websites, commercial and private, including a PHP/MySQL CMS for a professional photography website. <http://www.shutterdream.net>

Other Interests MIT Varsity Lightweight Crew, economic philosophy, and electronic music.

Talks and White Papers

2008 **A Security Analysis of the Massachusetts Bay Transportation Authority** Project to assess the security of the Boston subway's two types of farecards, the CharlieTicket and the CharlieCard. Found significant security holes in the CharlieTicket. Currently doing consulting work for the MBTA to help resolve the system's issues.

2007 **Real-time Raytracing on the Playstation 3** Presented at the 2007 Game Developers Conference. Shared optimization techniques and design methodology for real-time raytracing using the Cell processor.

2005 **SCRYPTO Protocol** Paper describing a secure anonymous internet communication protocol utilizing steganographic and cryptographic methods. Includes reference implementation. (Available on <http://www.rustyryan.net/projects>)

Undergraduate Research (UROP)

Fall 2008 **Organic Indoor Location Project** In charge of design and implementation of the backend of a system for providing indoor localization to wifi-enabled cell phones and PDAs.

Spring 2008 **Media Lab SmartCities Project : City-car control software** Wrote a control system for a 4-wheel electric vehicle capable of over 180 degree rotation of its wheels that interacts with a joystick to allow a user to control both the direction and speed of the wheels.