

# Martin Michelsen

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## Objective

To be challenged by difficult and interesting problems and given the opportunity to innovate in solving them; to use my current knowledge and experience to build complex and elegant solutions, while continually learning more.

## Skill set

Much of what I know about software development is self-taught. I began learning the C language in the fifth grade, and from there branched out into other languages. I have a strong background in Windows software development ranging from GUI formulation to Direct3D implementation to parsing executable files. I've reverse-engineered systems and protocols including the Nintendo GameCube hardware and API, the encrypted binary protocol for Sega's Phantasy Star Online game, and the PRS compression scheme. I have built a robust server architecture which I've used to create game servers, HTTP and SMTP servers, and proxies.

I am experienced with C/C++, assembly (mostly x86 and PowerPC, and a bit of 680x0), Java, and PHP, and am learning a few other languages, including Haskell and Python. I've built Web sites in PHP, using (X)HTML, CSS, JavaScript, and MySQL databases when necessary. I have developed on Windows as well as Mac OS X and Linux/Unix systems and can work just as well on each OS.

My education (both in the classroom and independent learning) has been heavily practical. While I understand and enjoy theoretical concepts in computer science quite readily, I am still being introduced to the formal foundations of the field.

## Projects

creator of **GCARS-CS**, a game enhancer for Nintendo GameCube games which uses the console's network adapter to bring multiplayer (offline) games online. I wrote routines to interface with the network adapter hardware and read and patch game memory on-the-fly, and developed routines to keep games on distant consoles synchronized, even with long ping times.

creator of the **Aeon** project (also known as **newserv**), a game server for Sega's Phantasy Star Online, a multiplayer online RPG. I built the server's architecture and reverse-engineered much of the game's communication protocols. Community members tested the server, fixed bugs, and helped implement new features.

author of **Lab 8**, a GPGPU-based fluid dynamics simulator (uses nVidia's CUDA).

author of **smtpserv**, an SMTP server supporting message relaying, mailing lists with optional PGP encryption, and simple scripts.

author of **aPress**, a Windows portable executable (PE) compressor.

author of **Windows PPE**, a sandbox for testing suspicious programs.

*Many more of my projects are listed, and some are available for download, at*

*<http://www.fuzziqersoftware.com/projects.php>. Source is available upon request for many of these projects.*

## Education

**California Institute of Technology**, class of 2012 (current senior)

B.S. in Computer Science (overall GPA: 4.0; in-major GPA: 4.1)

Math Club member

Club for Computer Science member

## **Employment History**

### **California Institute of Technology** (Pasadena, CA)

September 2009 - Present (excluding summers)

Undergraduate teaching assistant:

CS11 (Computer Language Shop): how to program in C++

CS21 (Decidability and Tractability): decidability and complexity theory

CS24 (Introduction to Computing Systems): assembly languages, caching, memory and processor models, and other details on the internals of modern computers

Undergraduate instructor:

CS2 (Introduction to Programming Methods): basic algorithms and logic in Python

CS101C (GPU Programming): how to write GPU programs using GLSL and CUDA, and more importantly, how to think about parallel programming and algorithms

### **Facebook, Inc.** (Palo Alto, CA)

June 2010 - September 2010

Software engineering intern

Built a testing and performance benchmark suite for a job processing system in C++

### **California Institute of Technology** (Pasadena, CA)

November 2010 - June 2011

Undergraduate research assistant in GPU computing

### **Facebook, Inc.** (Palo Alto, CA)

June 2011 - September 2011

Software engineering intern

Project is still confidential

## **Other Activities**

### **California Institute of Technology**

#### **Representative to the Board of Control**

Reviews and decides cases of academic dishonesty

#### **Representative to the Conduct Review Committee**

Reviews and decides cases of nonacademic dishonesty

**Treasurer of Blacker House**, one of the eight student houses