Jim Gaines

Please e-mail me for personal contact information: jim [dot] gaines [at] ieee [dot] org

Summary of Qualifications

- Developed signal processing software on GNU/Linux
- Embedded system design for U.S. military applications
- Research experience in wireless communications

Education

Bachelors of Science, Electrical Engineering — University of Utah
Major GPA: 3.28 — May 2008

Bachelors of Science, Mathematics; Minor: Physics — University of Utah
Major GPA: 3.37 (4 courses remaining) — (Expected) May 2009

Honors and Awards

Undergraduate Research Scholar	May 2008
SMART Grant ($2000)	Jan 2008
SMART Grant ($2000)	Sept. 2007
1^{st} Place, IEEE Student Website Design Contest	Oct. 2007
Undergraduate Research Opportunities (UROP) Scholarship ($600)	Sept. 2007
Undergraduate Research Opportunities (UROP) Scholarship ($1200)	May 2007
Dean's List, College of Engineering	May 2007
Best Presentation, ECE Dept. Technical Open House ($100)	Mar. 2007
Hill Air Force Base Clinic Grant ($1000)	Sept. 2006

Relevant Courses

Digital Signal Processing	Stochastic Processes	Digital Communications
Digital System Design	Computer Architecture	Feedback and Control Systems
Microelectronics I/II	Abstract Algebra I	Complex Variables
Number Theory	Mathematical Analysis I/II	Topology

Academic Projects

Adaptive LMS Equalizer in Matlab	PID Controller for Velocity Tracking
FILO Memory Stack in MIPS	MPSK Transceiver in Matlab
8-bit ALU in Verilog	16-bit Microprocessor in Verilog
PLL Frequency Synthesis	Pink Noise LTI Filter in Matlab

Research Experience

Entropic Analysis of Spectrum Sensing for Cognitive Radio — Univ. of Utah
Sensing and Processing Across Networks (SPAN) Research Group — May 2007 – present

- **Publication**: University of Utah Undergraduate Research Abstracts Journal
- **Presentation**: University of Utah Undergraduate Research Symposium
- Developed software in Python, bash and Matlab on the GNU/Linux platform
- Developed software for the Universal Software Radio Peripheral (USRP)
- Designed ISM band spectrum analyzer in GNU Radio

Context-Free Language Translation for the DDC Assembler — Univ. of Utah
Hill Air Force Base Clinic — Aug. 2006 – May 2007

- **Paper**: DDC Assembly Language Specification and Assembler Implementation
- **Paper**: DDC Assembly Language Developer's Guide
- **Presentation**: ECE Dept. Technical Open House (Awarded Best Presentation)
- Developed software in C# and ANTLR with Visual Studio on .NET
- Designed context-free BNF grammar for the MIL-STD1553 DDC ASIC
- Designed LL(k) parser in ANTLR with a hierarchical exception handler

Software

C/C++/C#	Python	Maple	Matlab	bash
PHP	SPICE	Verilog	MIPS ASM	GNU Radio
vi	Java	wxWidgets	Visio	Regular Expressions
XML/HTML	SQL	LaTeX	ANTLR	Compiler Design

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Technical Skills

- Interfacing with and developing software for the Universal Software Radio Peripheral
- System administration on GNU/Linux and Windows
- Strong understanding of protocols and networking (LAN, WAN and WiFi)
- GUI development with wxWidgets in Python and .NET in C#
- XILINX Spartan FPGA course project development and synthesis in Verilog

Employment

Domain Administrator — University of Utah
SPAN Research Group — Aug. 2007 – present

- Designed and managed Debian GNU/Linux domain server
- Developed and implemented various server/user scripts in bash and Python
- Administered and networked several Windows and GNU/Linux workstations

Website Administrator — University of Utah
School of Computing — Sept. 2007 – present

- Designed and managed:
  - `http://urban.cs.utah.edu` for the DARPA Urban Challenge Team
  - `http://ieee.cs.utah.edu` for the IEEE Student Chapter
- Utilized Apache HTTP Server, PHP and Drupal CMS on GNU/Linux

Lab Technician II — Salt Lake Community College
Academic Computing — Aug. 2003 – present

- Assisted students and faculty with computers and other technology
- Administered large computer LAN in an academic environment
- Developed and implemented various server/user scripts

IT Consultant — BHS Marketing
Information Technology — Feb. 2003 – present

- Consultant for one of Utah's 100 fastest growing companies
- Designed and assembled several workstations within a budget
- Provided security advisement and incident response for interstate business WAN

Math Lab Aide — Salt Lake Community College
Department of Mathematics — Sept. 2002 – May 2005

- Assisted students and faculty with calculators and other technology
- Tutored Algebra I – Multivariable Calculus and Differential Equations
- Assisted students with Maple, Matlab, Excel and course projects

Membership

SPAN Research Group	ECE Dept., University of Utah
DARPA Urban Challenge Team	School of Computing, University of Utah
Information Theory Society	IEEE
Communications Society	IEEE
Signal Processing Society	IEEE

Interests

Cognitive Radio	Communications/Statistical Signal Processing
Embedded Systems	Information Security
Compiler/Language Design	Functional Analysis
Information/Coding Theory	Electromagnetic Field Theory