

# Hans Fugal

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## Education

**PhD** Computer Science, New Mexico State University (*Fall 2005–August 2009 expected*)

GPA **3.80/4.00**

Research in audio processing: Identification of pipe organ stops in audio recordings

Digital Signal Processing, Machine Learning

Significant class projects: Haas stereophonic effect on an embedded DSP board.

**BSc** Computer Science, Brigham Young University (*Fall 1996, Fall 1999–Spring 2004*)

GPA **3.76/4.00**

Significant class projects: implemented a network MIDI protocol dealing with real-time issues like latency and jitter; rudimentary speaker identification using machine learning; multi-agent capture the flag game AI.

## Publications

H. Fugal, "Optimizing the Constant-Q Transform in Octave," *Linux Audio Conference*, April 2009.

H. Fugal, "Hack #13: Edit XML with Vim." In M. Fitzgerald, *XML Hacks*, O'Reilly Media, 2004, pp. 49–53

## Skills

### Programming

Ruby, C, (ba)sh, C++, real-time, pthreads, sockets, MATLAB/Octave, JACK, Qt, MVC, DSP, Motorola assembly, QNX, Java. Familiarity with Perl, SWIG, XSLT, Erlang, Scheme. Proficient with a number of revision control systems, especially git and mercurial.

### System Administration

Linux, Debian, RedHat, HP-UX, DNS, OpenVPN, IPsec, PPTP, Samba, Postfix, Dovecot, Asterisk, SER, SIP, Tivoli Backup, NIS, NFS, MySQL, Postgres, Apache, scripting, iptables, QoS, HylaFAX, bayesian spam filtering, ClamAV, Amavis, DansGuardian, Squid, Nagios, mon, SNMP, cacti

### Web

Ruby on Rails, XHTML, CSS, SVG, PHP. Familiarity with Javascript and AJAX.

## Experience

**Independent Consultant** (*Fall 2005–Present*)

Voice over IP solutions for small businesses. Asterisk, SER, SIP, IP phones, analog adapters

Linux system administration. Troubleshooting, maintenance, added features

Web development. Primarily Ruby on Rails

**Instructor, C Programming** (CS 167/467), Computer Science Dept, NMSU (*Summer 2006, Spring 2008*)

Designed and taught the course and programming assignments

**Instructor**, Computer Literacy (CS 110), Computer Science Dept, NMSU (*Fall 2007*)

Teaching Assistant, Computer Science Dept, NMSU (*Fall 2005–Spring 2009*)

Automata, Languages, Computability (CS 510)

Data Structures and Algorithms (CS 372)

User Interface Design (CS 485)

Introduction to Data Structures (CS 272)—second-semester CS/Java course for CS majors

Algorithmic Computation (CS 171)—Introductory CS/Java course for CS majors

Computer Literacy (CS 110)—Office, HTML, Visual Basic

**System Administrator**, Wencor West, Inc. (*Spring 2004–Summer 2005*)

Implemented VPN solution for remote offices and roadwarriors using OpenVPN and IPsec

Implemented single sign-on, unifying Linux, Windows domain, Samba, Postgres, and Apache

Designed and implemented Tivoli Backup/Archive backup and restore strategy

Primarily Linux (RHEL and Debian) servers

Mail, DNS, web, database, file servers, user accounts, CUPS, some Lotus Notes and Windows

**Research Assistant**, Mechanical Engineering Dept, BYU (*Summer 2003–Spring 2004*)

Versatile Machine and Actuator Control—smart home and machinery control

Custom **real-time network protocol** on ethernet hardware for device control

Real-time network system control developed in **C on QNX**

Developed collision-free multirate ethernet communication scheme

**Research Assistant**, Computer Science Dept, BYU (*Summer 2002–Spring 2003*)

Genealogy visualization and database merging

**System Administrator and Web Developer**, SurveyPro (*2000–2002*)

Linux, Apache, MySQL, email, DNS, HTML and Perl.

**Web Development Intern**, The Church of Jesus Christ of Latter-day Saints (*Summer 2001–Spring 2002*)

Vignette StoryServer. HTML and Javascript

**Assistant UNIX System Administrator**, CAEDM, College of Engineering, BYU (*Fall 2000–Spring 2001*)

HP-UX system administration

User accounts, quota and printing accounting Perl and shell scripts

**Research Assistant**, School of Music, BYU (*Summer 2000*)

Maintained Organ Tutor, written in Macromedia Director

Organ Composer Information Database webmaster

Teaching Assistant, Java Programming (ISys 540), Information Systems, BYU (*Spring 2000*)

## Portfolio

Selections from <http://hans.fugal.net/src>

ABD HID caps lock patch for the Linux kernel

lindbergh: flight planning software

rosc: a Ruby library for Open Sound Control

batphone: a Ruby Asterisk Gateway Interface

k20: ANSI terminal K-20 meter for JACK

ruby-audio: Audio library for Ruby

ruby-wx: METAR library for Ruby

hearnet: an audible network analysis tool (C++, JACK)

LAM: Music Made with Linux website (<http://lam.fugal.net>)

nmidi: networked MIDI (C, ALSA)

## **Grants, Fellowships & Awards**

Google Summer of Code (*Summer 2006*)  
Added persistent undo to Ardour

GAANN Fellow (*Summer 2006–Fall 2008*)

GENTECH Research Grant (*2002–2003*)

An XML implementation of the Genealogical Data Model (<http://gdmxml.fugal.net>)  
Research presented at the National Genealogical Society conference, 2003

Eagle Scout, Boy Scouts of America (*1995*)

## **Volunteer Service**

Various presentations for Linux Users Groups on subjects such as Vim, QoS, VOIP, email administration, Debian, GnuPG, and others.

President and Vice President, Computer Science Graduate Student Organization, NMSU

System Administrator, Provo Linux Users Group

System Administrator and Officer, BYU UNIX Users Group

Maintained 3 Debian Packages for 3 years.

References available upon request.