

FRANCIS CHANG

Home Address

(**) ***_****

francis@francischang.com

School Address

Maseeh College – CMPS
Portland State Univ.
PO Box 751, Portland,
Oregon, 97207-0751

<http://www.francischang.com>

SKILL SUMMARY

- Languages:** C/C++, Java, Haskell, Visual C++/Basic, Basic, Pascal, Modula-3, HTML, Scheme, Assembly, Win32/MFC/COM/OpenGL Programming, LSL
- Operating Systems:** Linux, various UNIXes, Windows NT/2k, DOS, GCOS, PalmOS
- Hardware:** Understanding of Digital Design theory and Fundamental Electronics, Constructing, Maintaining, Repairing and Upgrading PCs
- Courses & Projects:** Compiler Construction, Computer Graphics, Real-time Operating Systems, Concurrent Programming, Digital Design, Computer Vision, Networking/Internet Technology/Multimedia, Systems Security

SELECTED PUBLICATIONS

Packet Classification

- Francis Chang, Wu-chang Feng, Wu-chi Feng, Kang Li, "Efficient Packet Classification with Digest Caches", Network Processor Design: Issues and Practices, Editors: Patrick Crowley, Mark Franklin, Haldun Hadimioglu, Peter Onufryk, Morgan Kaufmann Publishers, 2005, ISBN: 0-12-088476-3
- Francis Chang, Wu-chang Feng, Wu-chi Feng, Kang Li, "Efficient Packet Classification of Digest Caches", in Proc. of the Third Workshop on Network Processors & Applications (NP3), February 2004, Madrid, Spain.
- Francis Chang, Kang Li, Wu-chang Feng, "Approximate Caches for Packet Classification", in Proc. IEEE INFOCOM 2004, March 2004, Hong Kong.
- Kang Li, Francis Chang, Damien Berger, Wu-chang Feng, "Architectures for Packet Classification Caching", In proceedings of the 11th IEEE International Conference on Networks (ICON 2003)
- Francis Chang, Kang Li, Wu-chang Feng, "Approximate Caches for Packet Classification", ACM SIGCOMM (poster session), August 2003, Karlsruhe, Germany.)

Game Network Traffic Measurement

- Francis Chang, Wu-chang Feng, "Modeling Player Session Times of On-line Games", In Proceedings of NetGames 2003, May 2003.
- Wu-chang Feng, Francis Chang, Wu-chi Feng, Jonathan Walpole, "Provisioning On-line Games: A Traffic Analysis of a Busy Counter-Strike Server", In Proceedings of the Internet Measurement Workshop, November 2002.
- Francis Chang, Wu-chang Feng, Wu-chi Feng, Jonathan Walpole, "Provisioning On-line Games: A Traffic Analysis of a Busy Counter-Strike Server", ACM SIGCOMM (poster session), August 2002, Pittsburgh, Pennsylvania.

Virtual Human Interaction

- Nick Yee, Jeremy N. Bailenson, Francis Chang, Dan Merget. (2006, in press). "The Unbearable Likeness of Being Digital: The Persistence of Nonverbal Social Norms in Online Virtual Environments". The Journal of CyberPsychology and Behavior.

WORK EXPERIENCE

**Grad Student, Oregon Graduate Institute at OHSU/Systems Software Lab (SySL)
Portland State University/Systems & Networking (SyN)**

2001-Present

- Research Involvement:
 - Multimedia visualization of 3D environments, Network traffic analysis, packet classification algorithms, IXP network platform development, MPEG video
- Other responsibilities:
 - Taught CS 510: Malicious Code and Forensics, Fall 2004, Winter 2005, Winter 2006, Fall 2006, a graduate level course focusing on techniques and examples of malicious code as well as forensic analysis of techniques for protection and recovery from such malicious code.
 - Taught CSE506/606 NWP – Network Practicum, Fall 2003, a graduate level course in network processor development, focusing on the the Intel IXP1200 platform. Received a class rating of 4.7/5.0, the second highest for an instructor teaching that quarter.
 - TAing CSE58x – Network Practicum. Tasks involved creating assignment curriculum, lecturing, grading, assisting students, lab administration.
 - TAing CSE513 - Introduction to Operating Systems. Tasks involved creating assignment curriculum, marking, giving tutorials and general instruction in NACHOS operating system
 - Recruiting and management of undergraduate interns in SysL

Research Assistant, University of Waterloo/Computer Graphics Laboratory

Summer 2000

- Developed prototype volume rendering software, based on nVidia GeForce 3 texture shader & register combiner technology. (Now known as nfiniteFX engine)
- Algorithms were based on fixed-grid cubic topology, with a static data-set. (MRI and CT data)
- The end result was fully shaded, real-time rendered volume, written in a mixture of Tcl/TK, C/C++ and OpenGL, with nVidia specific extensions.

Software Designer, Proxinet/Puma Technology

Winter 2000, Fall 2000

- Worked in the Thin Client team, developing a wireless Web Browser for the PalmOS platform
- Designed, developed & maintained UNIX/Java branding system
- Designed, developed & maintained multi-threaded Java AFTP/TCP protocol sniffer
- Work involved raster image processing and research, interviewing, compression research, UNIX hashing programs, transmission and data encryption/obfuscation
- Developed a wireless web browsing system on PalmOS, using Codewarrior C and gcc
- Research, involving image processing, compression and mathematical functions
- Designed, advised & wrote specs of the browsing system, image processing and transmission protocol
- Interviewing prospective software engineering candidates
- Experience in Linux/Solaris and WinNT/2k:
 - File and Data transfer mechanisms using TCP/IP and Internet technologies
 - Developing java file and image manipulation, validation and processing utilities

Software Design Engineer, Microsoft Corporation

Summer 1999

- Worked in Visual Basic Projects Team, developing using MFC/ATL/COM with Visual C++
- Experience included:
 - Adding, Designing and Extending functionality to Win9x Unicode/API wrapper libraries
 - Developing new COM implementations, including the VB7 Upgrade Wizard
 - Check-in Suite Design and Suite Library implementation
 - Miscellaneous internal utility development/bug fixes/features

Software Developer, Corel Corporation

Fall 1998

- Worked in the Bitmap Effects Team, developing for Win32 with MFC and MS Visual C++
- Development included:
 - User interface design and implementation with MFC
 - Image processing and bitmap effect algorithm analysis, design and implementation

- Interfaces with Corel Draw and Corel Photo-Paint
- Graphics challenges included concurrent programming, anti-aliasing primitives and colour space manipulation

Software Designer, Thinkage Ltd.

Summer 1997, Winter 1998

- C/C++/YAY development, on various platform including WinNT, Win95, UNIX and GCOS
- Worked on the C math libraries for the GCOS operating system, and Intel x86 machines
 - Involved designing mathematical approximations, resolving overflow/underflow and truncation errors and hardware limitations
 - Developed new functionality in compliance with ANSI C 98 standards
- Developed a win32 telnet application in Borland C++
 - Programming included designing win32 multi-threaded constructs, macro programming and implementing the Kermit file transfer protocol
- Worked on prepro, a precompiler that embedded a new macro language in C++
- prepro was used as a tool for compiler construction and table construction/maintenance

Computer Programmer, Adnet Information Systems

Summer 1996

- Used Visual Basic 3.0 & 4.0 to develop a custom data-management application for Advanced Debt Technologies Ltd.
- Programming included:
 - SQL, using MS Access Databases
 - Microsoft Mail Merge
 - Automated banking
 - OLE implementation for the generation of MS Excel spreadsheets
 - Cross-platform programming

Webmaster, Queen Elizabeth Park School

Winter 1994 – Spring 1996

- Set up and designed QEP's Internet website, and performed related tasks, including:
 - Website management and development coordination
 - Instructing and assisting the learning and writing of HTML

Computer Programmer and Consultant, Annex Galaxies

Summer – Fall 1995

- Started a small business providing services in networking and consulting, Internet website development and shareware programs

Systems Jr. Technician, Region of Halton

Spring 1995

- Diagnosed, repaired, assembled and upgraded PC computers, Attended to service calls
- Instructed coop students on PC maintenance and operation

Computer Programmer & Summary Writer, McMaster University

Summer 1994

- Developed programs to model the behavior of fractal and chaos algorithms for grad students
- Created notes and summaries intended for education purposes for graduate students studying chaos and fractals

EDUCATION & INTERESTS

OGI School of Science & Engineering at OHSU

2002-Present

- Graduate Student, Instructor and Teaching Assistant, Computer Science & Engineering Dept.
- Candidate for Ph.D. in Systems Software research
- Board of directors of VERTU (www.vertuous.org), an organization that seeks to raise funds for real-world charities and non-profit organizations in virtual worlds

University of Waterloo
1996-2001

- Honours Co-Op Bachelor of Mathematics in Computer Science
- Former Vice President of the Archery Club & Member of the Badminton Club
- Received various highschool scholarships & awards
- Extracurricular work & projects includes
 - Graphics Algorithm Development
 - Ported ssh 1.2.26 to Win32
 - Design and implementation of a portable 4-dimensional stereogram engine
 - Wrote documentation for the Linux on Laptops Survey
- Volunteered for the Ronald McDonald House
- Musical interests include guitar and violin