

R A N D Y L . R I B L E R

EDUCATION

Postdoctoral Research Associate
University of Illinois
Urbana-Champaign, Illinois
August 1996 – July 1998

Doctor of Philosophy
Computer Science and Applications
Virginia Tech, Blacksburg, Virginia
April 1997

Master of Science
Computer Science
George Mason University, Fairfax, Virginia
May 1991

Bachelor of Science
Computer Science
University of Maryland, College Park, Maryland
May 1980

RESEARCH INTERESTS

Information visualization, performance analysis, high-performance computer architectures, parallel and distributed processing, compilers, machine learning, genetic algorithms, algorithms for fair division

ACADEMIC EXPERIENCE

June 1998 to present –Computer Science Program Lynchburg College

Professor of Computer Science (fall 2011 – present)

Vietnam Education Foundation U.S. Faculty Scholar (spring 2013)

Associate Professor of Computer Science (fall 2004 – spring 2011)

Fulbright Scholar (February 2006 – July 2006) Vietnam National University, Hanoi

Computer Science Department Chair (fall 2009 – present)

Computer Science Program Coordinator (fall 2000 – 2008)

Assistant Professor of Computer Science (fall 1998 – 2004)

Teaching

Taught a wide range of courses (fifteen in all) including seven that I initiated. I have taught all the computer science courses required for our major, and eight elective courses. I have worked to maintain high standards across the curriculum, to reduce the attrition rate in the introductory classes, to keep our program in step with the newest technologies, and to accommodate the different needs of our majors and minors.

Courses taught:

Introduction to Computer Science and Structured Programming I (CS141)

Introduction to Computer Science and Structured Programming II (CS142)

Data Structures and Abstraction (CS342)

Computer Networks (CS335 and CS235)

Senior Project (CS451/CS452)

Artificial Intelligence (CS380)

Computer Architecture and Assembly Language Programming (CS271)
Operating System and Computer Organization (CS360)

New Courses initiated

Special Topics for Computer Science Minors (with Dr. Constantine Roussos)

New Courses initiated and taught

Compiler Construction (CS491)

Advanced C++ Programming (CS493)

Event-driven programming (CS493)

Database Programming with Oracle (with Dr. Constantine Roussos) (CS494)

System and Network Administration (with Dr. Constantine Roussos) (CS201)

User Interface Design (CS49x – taught at Vietnam National University, Hanoi)

Computer Forensics (CS355 – taught for the first time in fall 2009)

Courses taught as independent study

Computer/Network Security (CS397)

Programming Languages (CS322)

Operating Systems (CS360)

Course of Study Initiated

Computer Science Applications Minor (with Dr. Constantine Roussos)

Service Highlights

- Program Coordinator/Department Chair for Computer Science (fall 2000 – present)
- Computer Science Program Review (2012)
- Faculty Steering Committee Chair (2010 and 2011)
- General Education Oversight Committee Chair (2015-2016)
- White Rock Education Center Computer Systems Development – work with student interns in the development and maintenance of computer networks for White Rock's educational programs.
- Co-authored (with Dr. Roussos) a proposal to EPC that resulted in the establishment of a new computer science minor
- Worked with other VFIC schools in the development of the TEK.XAM, a computer skills assessment and certification test that is now licensed to scores of colleges and universities nationwide
- With Drs. Roussos and Briggs established and coached the Lynchburg College Programming Team – traveled with team to competitions in Tennessee and South Carolina.
- Serves as Departmental Coordinator for Microsoft's MSDNAA program. This program provides licenses to virtually all Microsoft software for computer science labs, computer science students, and computer science faculty.
- Faculty advisor and initiator of the Lynchburg College Chess Club.

Conferences Attended

SIGCSE Conference on Computer Science Education, Raleigh, NC, March 2012
GECCO Conference on Genetic and Evolutionary Computing, Washington, DC, July 2005
PKAL Summer Institute in Williamsburg, VA, July 2002
PKAL National Assembly in Washington D.C., October 2002
Consortium for Computing in Small Colleges' annual conference in Greenville, SC, November 2002
Consortium for Computing in Small Colleges' annual conference in Nashville, TN, November 2001
InfoViz2000, the IEEE Information Visualization Conference, Salt Lake City, UT, October 2000

Short Courses, Seminars and Workshops

Workshop on Distributed Computation, Roanoke, Virginia, March 2010
Chautauqua 3-day short course on Cognition and Teaching at Duke University, May 2003
SANS Institute 3-day Workshop on Computer Network Security at Virginia Tech, November 2001

Recently Gained Proficiency in Software Technologies

Extreme Programming and other Iterative Software Development Methodologies
Microsoft .NET technologies including C# and C++/CLI
Microsoft ASP.NET web-based technologies
Computer Forensic analysis, including EnCase analysis software

Proficiency in Additional Software Technologies

Programming Languages: C++, C++/CLI, C#, C, Java, Python, Basic, Fortran, Lisp, Prolog, Intel, SPARC, TMS320 and MIPS assembly languages
Dialects: Visual C++ and MFC, Visual Basic, Sun CC, GNU C/C++
Operating Systems: Microsoft Windows, SunOS/Solaris, Linux, Unix, VAX/VMS
Networking: TCP/IP (Berkeley/Winsock) sockets
Web: HTML, PHP, ASP.NET
Shell: Bourne shell, C shell, awk, Per
Database Management Systems: MySQL, Microsoft Access, Microsoft SQL Server, Oracle

External Grants

Vietnam Education Foundation ([VEF](#)) grant to teach at Vietnam National University from January 2013 to May 2013. Courses include a graduate course in Artificial Intelligence and an undergraduate course in Software Engineering.

One of the principal authors of an NSF grant that resulted in \$278,000 in scholarships for our Computer Science and Mathematics Majors

Fulbright Scholar Grant to teach at the Vietnam National University from February 2006 through June 2006. Taught undergraduate course in Artificial Intelligence and graduate course in User-Interface Design.

Scholarly Activity

Research

Three-Hit Wonder - a system that allows blind and disabled computer users to access their music collection, Internet radio, podcasts, and email using only three different inputs. The system uses voice prompts and a application programmer interface to Apple's iTunes.

GPS of Hanoi - A genetic programming system developed as part of research project at the Vietnam National University in Hanoi.

The Geneurator Project – A system that uses genetic algorithms to produced neural networks. Geneurator also makes use of visualization techniques to offer researchers insights into the normally opaque process of network evolution. Over the last four years 11 students have been involved with this project, and produced software for handwriting recognition, neural network visualization, distributed processing of genetic algorithms, and acoustic signal processing. Seven students have presented their work at the Student Scholar Showcase, and one has co-authored a paper accepted by a refereed international conference on neural networks (ANNIE 2003). The Geneurator project now consists of well over 10,000 lines of code, about 20% of which was written by students.

Same – Same is a program that identifies similarities in sets of documents. It has been used as a plagiarism detection mechanism in a number of schools including Virginia Tech, Georgia Tech and Hood College. I presented a paper entitled *Using visualization to detect plagiarism in computer science classes*, describing Same at the *IEEE InfoVis 2000 Conference* in Salt Lake City, Utah in October 2000. The JISC Source Code Plagiarism Report concludes that most instances of plagiarisms involve a group of students, rather than just a pair and make the following remark:

The only known approach to improved and alternative visualization tools are the Composite Categorical Patterngram (CCP) reported by Ribler and Abrams (Ribler and Abrams 2000) which allow clusters of plagiarized submissions to be detected.

Although the technology on which Same is based was reported as part of my dissertation, the Same program itself has been developed over the past few years, and a major enhancement was undertaken from 1998 to 2000 in support of the InfoVis 2000 paper.

LCSketch – LCSketch is a program that allows students in introductory C++ programming classes to produce graphical displays and simple animations. The goal of the system is to make the introductory classes more enjoyable, by providing fledgling programmers the ability to produce more interesting programs. LCSketch is implemented using a client/server architecture that insulates the student from the complexities of Microsoft Foundation Classes and allows any number of student programs to interact on the same display. Dr. Will Briggs used an early version of LCSketch with success in his CS141 and CS142 classes during the spring of 2003, and I plan to utilize the current system when I teach these classes in the fall. I have recruited a student, Chris Tolley, to work with me on extensions to the program as part of an independent study in the fall.

Consulting

HDF Group, Summer 2006

Consulted on the development of a .NET version of the Hierarchical Data File libraries currently available as part of HDF5 project.

Enscoc Inc., Summer 2002

Developed software for the DARPA-funded *Smart Building* project. Wrote C++ programs that monitor sensors that detect chemical and biological weapons attacks and control ventilation systems, doorways, and alarm systems.

Enscoc Inc., Summer 2001

Developed network-based security software used to protect both the Pentagon and the FBI facility at the Winter Olympic Games in Salt Lake City.

Electronic Arts, Summer 2000

Wrote multithreaded C++ programs for the network infrastructure of online games. This software is used as part of *The Sims Online*, one of the most popular computer game ever developed.

Academic Employment

**August 1996 to July 1998 - Department of Computer Science,
University of Illinois, Urbana-Champaign**

Postdoctoral Research Associate, Staff member of Daniel A. Reed's Pablo Group

Designed and implemented the DARPA funded *Autopilot* instrumentation library for real-time adaptive steering of parallel and distributed applications. Worked with the Pablo Group scalable I/O and virtual reality development teams to integrate Autopilot sensors and actuators into an immersive environment for the visualization and manipulation of I/O performance.

September 1991 to August 1996 - Virginia Tech - Computer Science Ph.D. Candidate
Graduate Teaching Assistant (Fall 1992 to Spring 1996)

Fall 1995 and Spring 1996 - Instructor for introductory Unix class.

Taught three one-hour sections each week to a total of 90 students each semester.
Developed lectures and course materials.

Fall 1994 - Lab instructor for assembly language programming class.

Taught two sections twice each week. Developed lectures and class exercises.

PROFESSIONAL EXPERIENCE

June 2001 to August 2001 and June 2002 to August 2002

EnSCO, Inc., Springfield, Virginia – Contractor/Consultant

Developed software for the DARPA-funded *Smart Building* project. Wrote C++ programs that monitor sensors that detect chemical and biological weapons and control ventilation systems, doorways, and alarm systems.

Developed network-based security software used to protect both the Pentagon and the FBI facility at the Winter Olympic Games in Salt Lake City.

May 2000 to August 2000 – ea.com, Charlottesville, Virginia – Contractor

Developed high-performance multithreaded software and stress-tested systems for handling very large numbers of simultaneous, interactive users. Analyzed performance of several candidate system configurations.

August 1991 to August 1996 - Contract Work

General Electric Medical Systems, Waukesha, Wisconsin

Developed Motif-based user interface and diagnostic tests for GE's next generation CAT scanner.

National Eye Trauma System

Created PC-based database documenting eye traumas for general research into causes and treatments of eye injuries. Wrote data collection program distributed to hospitals nationwide.

AMREX Commercial Real Estate System

Wrote Visual C++ and Visual Basic programs to support on-line commercial real estate transactions.

January 1988 to August 1991 - Star Technologies, Inc., Sterling, Virginia - *Senior Engineer*

Compiler group team leader for project to produce a vectorizing compiler for the Star 910/VP, a Sun-compatible SPARC-based supercomputer that was released in July of 1991. Responsible for the overall design of the compiler. Worked with Kuck and Associates Inc. (KAI) in the development and testing of the vectorizing compiler. Designed and implemented highly optimized routines to support concurrent vector processing and data movement between the main memory and the vector cache.

- Used syntax-directed parsers to implement microcode assemblers for Very Long Instruction Word (128-256 bit) architectures.
- Designed and implemented simulators for assessing machine architectures. Provided simulators to allow software development to proceed prior to the availability of hardware.
- Designed memory management algorithms for main memory and vector cache memory.
- Implemented medical image processing algorithms on a system of four parallel Texas Instruments TMS320 Floating-Point Digital Signal Processing chips.

May 1986 to January 1988 - Xenologic Inc., Newark, California - *Software Engineer*

Implemented Unix device-driver for the Xenologic X-1, the commercial version of a high-speed symbolic coprocessor originated at the University of California, Berkeley. The device-driver performs virtual memory management, processor I/O, and numeric processing. Also developed the library of Prolog built-in functions, and supplied utilities for hardware/software debugging. Designed methods that allow the integration of the X-1 into systems that are implemented with conventional programming languages.

September 1983 to May 1986 - Westinghouse Electric Corporation - *Senior Engineer*

Developed algorithms for and led the implementation of the Westinghouse Knowledge Processing System (KPS). This expert systems shell was implemented in both Lisp and Prolog, and contains many innovative approaches to knowledge representation, certainty propagation, attention focusing, and truth maintenance. KPS was adopted by several divisions within the corporation. .
Developed algorithms for the automatic generation of KPS rules

July 1980 to September 1983 - Ensco Inc., Springfield, Virginia – *Programmer, Senior Programmer/Analyst*

Designed, developed, and tested an array processor-based signal processing subsystem. Developed a device-driver for a custom A/D controller, and implemented numerous signal processing algorithms in microcode.

PROFESSIONAL ORGANIZATIONS

Association for Computing Machinery (ACM)
Consortium for Computing Sciences in Colleges (CCSC)

HONORS AND AWARDS

ΦΚΦ offered membership in 1993

UPE, the Computer Science National Honor Society, offered membership in 1993

NSF Project Kaleidoscope (PKAL) Faculty for the 21st Century, member since 2000

Bio in Who's Who in America since 2002

SELECTED PUBLICATIONS

Randy L. Ribler and Chris R. Jordan. Visualizing speciation in evolving neural networks, accepted for publication at ANNIE 2003

Randy L. Ribler and Daniel A. Reed. *Future Generation Computer Systems*, special issue (Performance Data Mining) 18(1), September 2001, pp. 175-187

Randy L. Ribler and Marc Abrams. Using visualization to detect plagiarism in computer science classes, *IEEE InfoVis 2000*, Salt Lake City, Utah, October 2000.

Daniel A. Reed and Randy L. Ribler. Performance analysis and visualization. In Ian Foster and Carl Kesselman, editors, *Computational Grids: State of the Art and Future Directions in High Performance Distributed Computing*, Chapter 15. Morgan Kaufmann Publishers, Inc., San Mateo, CA, 1999.

Randy L. Ribler, Jeffrey S. Vetter, Huseyin Simitci, and Daniel A. Reed. Autopilot adaptive control of distributed applications, Proceedings of the 7th IEEE Symposium on High-Performance Distributed Computing, Chicago, IL, July 1998 ([voted one of the best HPDC papers 1992-2012](#))

Daniel A. Reed, Ruth A. Aydt, Luiz DeRose, Celso L. Mendes, Randy L. Ribler, Eric Shaffer, Huseyin Simitci, Jeffrey S. Vetter, Daniel R. Wells, Shannon Whitmore, and Ying Zhang, "Performance Analysis of Parallel Systems: Approaches and Open Problems," *Joint Symposium on Parallel Processing (JSPP)*, pp, 239-256, Nagoya, Japan, June 1998 (*invited paper and keynote presentation*)

Randy L. Ribler. *Visualizing Categorical Time Series Data with Applications to Computer and Communications Network Traces*. PhD thesis, Computer Science Department, Virginia Tech, April 1997.
<http://scholar.lib.vt.edu>.

M. Abrams, R. Ribler, and A. Mathur. Two performance tool design issues and Chitra's solutions. In *ACM SIGMETRICS Symposium on Parallel and Distributed Tools*, Philadelphia, PA, May 1996.

R. Ribler, A. Mathur, and M. Abrams. Visualizing and modeling categorical time series data. In *Symposium on Visualizing Time-varying Data*, NASA Conference Publication 3321, Williamsburg, VA, January 1996. <http://www.cs.vt.edu/~chitra/docs/95vtvdRMA.html>

M. Abrams, S. Williams, G. Abdulla, S. Patel, R. Ribler, and E. A. Fox. Multimedia traffic analysis using Chitra95. In *Proc. ACM Multimedia '95*, San Francisco, CA November 1995.

Randy L. Ribler. The integration of the Xenologic X-1 AI coprocessor with general purpose computers. In *COMPCON 87*, San Jose, CA, February 1987. IEEE Computer Society.

Randy L. Ribler. KPS – an approach to knowledge representation. In *Proc. of the Westinghouse Symposium on Artificial Intelligence*, Pittsburgh, PA, October 1986

PRESENTATIONS

Randy L. Ribler. *The Xenologic X-1 Coprocessor*. Graduate Seminar, University of California, Berkeley, Spring 1987

Randy L. Ribler and Tam Ha. *A vectorizing compiler for a SPARC-based supercomputer*, SUN EXPO, July 1990

ADDITIONAL PROFESSIONAL ACTIVITIES

Program Committees:

2006 Fulbright Selection Committee, Hanoi, Vietnam

1998 ACM SIGMETRICS Symposium on Parallel and Distributed Tools, Madison, WI