Dr. Yuting Zhang
March 2012

Computer Science Department
Metropolitan College
Boston University
Boston, MA

Tel: 617-358-5683
Fax: 617-353-2367
Email: danazh@bu.edu
URL: http://people.bu.edu/danazh

EDUCATION

Ph.D. in Computer Science   09/2001 – 08/2006
Boston University, Boston, MA, USA   *GPA: 3.9*
Dissertation: *Window-Constrained Resource Management for Soft Real-Time Applications*

M.S. in Computer Science   09/1997 - 03/2000
University of Science and Technology Beijing, Beijing, China   *GPA: A- Rank: 1/14*
Thesis: *Instruction Level Parallelism in VLIW architecture*

B.S. in Computer Science   09/1993 - 07/1997
University of Science and Technology Beijing, Beijing, China   *GPA: 89/100   Rank: 2/89*
Thesis*: A CAI Tool for Computer Organization Course using Delphi*

TEACHING EXPERIENCE

Assistant Professor, Boston University Metropolitan College, Boston, MA 07/2011 - Present

- Software Engineering (CS673)
- Operating Systems (CS575)

Assistant Professor, Merrimack College, Boston, MA   01/2009 – 06/2010

- Intro to Information Technology (CSC1510)
- Computer Science I (C++) (CSC1610)
- C on Unix (CSC2520 & CSC2530)
- Programming Language (CSC3120)
- Software Engineering (CSC4910)

Assistant Professor, Wentworth Institute of Technology, Boston, MA   09/2008 – 12/2008

- Introduction to Computing and Problem Solving (CS165)
- Structured Programming for Engineering and Technology (CS114)

Assistant Professor, Allegheny College, Meadville, PA   09/2006 – 08/2008

- Introduction to Computer Science I (Java) (CS111)
- Data Communication and Networks (CS381)
- Operating Systems (CS440)
- Junior Seminar (CS580)

Teaching Assistant, Boston University, Boston, MA   09/2001 - 05/2004

- Computer Architecture (CS450)
- Computer Organization (CS210)

Instructor, University of Science and Technology Beijing, China   02/2000 - 07/2001

- Introduction to Computer Science
- C Programming
- English of Computer Science.

RESEARCH INTERESTS

Operating Systems and Networking, including Security, Scheduling in Multimedia and Embedded Real-time Systems, and resource Management in Virtual Execution Environments.

RESEARCH EXPERIENCE

Assistant Professor, Boston University Metropolitan College   07/2011 - Present

- Conduct research in the area of mobile security. Propose a multilevel protection framework for Android which attempts to analyze and detect application vulnerability, educate application developer to avoid attack, and enhance Android OS protection mechanism.

Assistant Professor, Merrimack College, Allegheny College
                    Wentworth Institute of Technology   09/2006 – 06/2010

- Proposed several different prediction algorithms for process-aware interrupt scheduling [1].
- Taught junior research seminar and advised undergraduate thesis research in topics such as routing algorithms for wireless senor networks, dynamic path-based piracy prevention, and friendly virtual machines on XEN architecture.
- Advised undergraduate projects to develop Andriod application and 2D scroller game.
- Conducted research in the area of resource management in virtual execution environments.

Graduate Research Assistant, Boston University   06/2002 – 08/2006
With Prof. Richard West and Prof. Azer Bestavros on *End-to-end Resource Management Research*

- Proposed a process-aware interrupt scheduling and accounting (ISA) algorithm [5].
- Implemented ISA algorithm for packet receiving interrupts in Linux kernel.
- Extended the window-constrained scheduling model for soft real-time communication systems. Furthered Dynamic Window-Constrained Scheduling (DWCS) algorithm and proposed Virtual Deadline Scheduling (VDS) algorithm and its variants for single server case [4][8][12].
- Implemented the window-constrained scheduling algorithms including VDS and its variants in Linux kernel as CPU schedulers and packet schedulers.
- Developed Multi-hop Virtual Deadline Scheduling (MVDS) algorithm to provide end-to-end window-constraint guarantee for multi-hop case [10].
- Implemented MVDS in the Network Simulator (NS).
- Designed a Friendly Virtual Machine (FVM) framework that enables VMs to share underlying resources both fairly and efficiently through a feedback-based self-adaptation mechanism [6].
- Implemented a prototype of the FVM framework in User-Mode Linux (UML).
- Collaborated on designing and implementing elastic TCP-base tunnels to provide soft bandwidth guarantees over best effort network through dynamically adjusting the number of TCP connections inside [9][11].
- Collaborated on designing and implementing Reduction of Quality (RoQ) attack framework in web server admission controllers and load balancers to expose adversarial exploits of the adaptation dynamics [2][3][7].

Yuting Zhang

Research Assistant, University of Science and Technology Beijing, China   07/1997 - 11/1999
With Prof. Qin Wang on *VLIW-like Computer System Research*

- Investigated instruction level parallelism in VLIW architectures and proposed a novel approach to solve resource competing between data and instruction access in unified cache in VLIW [13][14].

INDUSTRY EXPERIENCE

Student Internship, VMware Inc., Palo Alto, CA, USA   06/2005 – 09/2005, 12/2005 – 05/2006
With Dr. Carl Waldspurger on *Timer Sponge Project*

- Investigated time virtualization technology used in VMware ESX server.
- Reimplemented front end VMdesched driver in Linux 2.6 and Windows as part of VMware tools to improve the accuracy of time keeping and process accounting in VMware ESX server.
- Conducted thorough performance evaluation for the new implementation on both uniprocessor (UP) and multiprocessor (SMP) platforms. Proposed several approaches to improve its performance in SMP model.

Software Engineer, Linx Technology Co., Beijing, China   09/2000 - 07/2001
With Dr. Gong Min on *Secure Server System Project*

- Investigated the stack-based buffer overflow problem and its protection techniques.
- Implemented OS-level solutions to alleviate the vulnerability of the suid programs in Linux.

Student Internship, Intel China Research Center, Beijing, China.   11/1999 - 06/2000
With Dr. Joe.F.Zhou on *Natural Language Processing Project*

- Created a web-based GUI and a platform-independent GUI for English News Summary Software using Java/CGI and Tcl/tk, respectively.
- Created a news-preprocess tool using C++.
- Implemented some algorithms in research of English news summary using C++.

Member of R & D Staff, Wisdom Information Ltd. , Beijing, China   06/1998 – 11/1999

- Directed the development of a CPU simulator to simulate the MISC CPU and its external environment at the instruction level in terms of both logic and timing features using C/C++.
- Took part in the CPU/ASIC design, implemented and tested floating-point and memory management modules in VERILOG on Sun workstation systems using CADENCE EDA tools.

PUBLICATIONS

- **Conferences, Journals and Workshops**

  [1] Y. Zhang "Prediction-based Interrupt Scheduling ", In proceedings of the 30th IEEE Real-Tiime Systems Symposium (RTSS'09) WIP session, Washington, D.C., USA, Dec 2009.

  [2] M. Guirguis, A. Bestavros, I. Matta, and Y. Zhang. "Reduction of Quality (RoQ) Attacks on Dynamic Load Balancers: Vulnerability Assessment and Design Tradeoffs". In proceedings of the 26th IEEE INFOCOM (INFOCOM'07), Anchorage, Alaska, May 2007.

  [3] M. Guirguis, A. Bestavros, I. Matta, and Y. Zhang. "Adversarial Exploits of End-Systems Adaptation Dynamics". The Journal of Parallel and Distributed Computing (JPDC), Volume 67, Issue 3, pp. 318-335, March 2007.

  [4] R. West and Y. Zhang. "Comments on Window-Constrained Scheduling". IEEE Transactions on Computers (TOC), Vol 56, Number 5, pp. 718-719, May 2007.

[5] Y. Zhang and R. West. "Process-Aware Interrupt Scheduling and Accountability ". In Proceedings of the 27th IEEE International Real-Time Systems Symposium (RTSS'06), Rio de Janeiro, Brazil, December 2006.

[6] Y. Zhang, A. Bestavros, M. Guirguis, I. Matta and R. West. "Friendly Virtual Machines: Leveraging a Feedback-Control Model for Application Adaptation". In Proceedings of the 1st ACM/USENIX Conference on Virtual Execution Environments (VEE'05), Chicago, Illinois, June 2005.

[7] M. Guirguis, A. Bestavros, I. Matta and Y. Zhang. "Reduction of Quality (RoQ) Attacks on Internet End-Systems". In Proceedings of the 24th IEEE INFOCOM (INFOCOM'05), Miami, Florida, March 2005.

[8] Y. Zhang, R. West and X. Qi. "A Virtual Deadline Scheduler for Window-Constrained Service Guarantees". In proceedings of the 25th IEEE International Real-Time Systems Symposium (RTSS'04), Lisbon, Portugal, December 2004.

[9] G. Diamant, L. Veytser, I. Matta, A. Bestavros, M. Guirguis, L. Guo, Y. Zhang and S. Chen. "itmBench: Generalized API for Internet Traffic Managers". In proceedings of the 10th IEEE Globecom Workshop on Computer-Aided Modeling, Analysis and Design of Communication Links and Networks (CAMAD'04), Dallas, Texas, November 2004.

[10] Y. Zhang and R. West. "End-to-end Window-Constrained Scheduling for Real-Time Communication". In proceedings of the 10th International Conference on Real-Time and Embedded Computing Systems and Applications (RTCSA'04), Gothenburg, Sweden, August 2004.

[11] M. Guirguis, A. Bestavros, I. Matta, N. Riga, G. Diamant, and Y. Zhang. "Providing Soft Bandwidth Guarantees Using Elastic TCP-based Tunnels". In proceedings of the 9th IEEE Symposium on Computer and Communications (ISCC'04), Alexandria, Egypt, July 2004.

[12] R. West, Y. Zhang, K. Schwan and C. Poellabauer. "Dynamic Window-Constrained Scheduling of Real-Time Streams in Media Servers". IEEE Transactions on Computers (TOC), Volume 53, Number 6, pp. 744-759, June 2004.

[13] G. Parmer, R. West, X. Qi, G. Fry and Y. Zhang. "An Internet-wide Distributed System for Data-stream Processing". In proceedings of the 5th International Conference on Internet Computing (IC'04), Las Vegas, USA, June 2004.

▪ **Previous Journals (in Chinese)**

[14] Y. Zhang and Q. Wang. "Solution to Resources Dependency of Unified Cache in VLIW Architecture". Computer Engineering and Applications, Volume 37, Number 15, August 2001.

[15] X. Wang, J. Wang and Y. Zhang. "The Controlling Technology of Branch Instruction for Instruction level Parallelism". Computer Engineering and Applications, Volume 35, Number 12, June 1999.

SELECTED PRESENTATIONS

[1] "Is Virtual for Real? ". Research in Computer Science Seminar, Allegheny College, Meadville, Pennsylvania, February 2007.

[2] "Window-Constrained Resource Management for Soft Real-Time Applications". PhD Thesis Defense. Boston University, Boston, Massachusetts, October 2004.

[3] "Friendly Virtual Machines: Leveraging a Feedback-Control Model for Application Adaptation". VMware Inc., Boston, Massachusetts, June 2006.

[4] "A Virtual Deadline Scheduler for Window-Constrained Service Guarantees". 25th IEEE International Real-Time Systems Symposium (RTSS'04), Lisbon, Portugal, December 2004.

[5] "End-to-end Window-Constrained Scheduling for Real-Time Communication". 10th International Conference on Real-Time and Embedded Computing Systems and Applications (RTCSA'04), Gothenburg, Sweden, August 2004.

[6] "Multi-resource Management for End-to-end QoS ". PhD Oral Exam Presentation, Boston University, Boston, Massachusetts, October 2004.

SUPERVISED STUDENT PROJECTS AND RESEARCH

- Felix Rohrer (Graduate Assistantship), Nebiyu Feleke and Kenneth Nimley. Android Security Research. Boston University Metropolitan College.
- Michael LoVerme (Group Leader), Ryan Fleming, Jonathan Caron, Antonio Guarino, "Super Eastgate: A fun 2D Scroller Game". Merrimack College. Graduated: May 2010.
- Christopher Wilkins (Group Leader), Jeff Titus, Stephan Krach, Pablo BajoLaso, "Minttrack: A Cool Andriod Application". Merrimack College. Graduated: May 2010
- Matthew DeDiana, "An Empirical Performance Evaluation of the Xen SEDF Scheduler on Multiple Heterogeneous Workloads". Allegheny College. Graduated: May 2008.
- Michael Folk (ACM Student Chapter Prize for the Best Senior Thesis). "Dynamic Path-Based Piracy Prevention". Allegheny College. Graduated: May 2007.
- Nathaniel Hupp. "A Study of Routing Algorithms for Wireless Sensor Networks". Allegheny College. Graduated: May 2007.

SUPERVISED STUDENT PRESENTATION

- Felix Rohrer (Graduate Assistantship), Nebiyu Feleke and Kenneth Nimley. "Multilevel Android Exploit Protection". To present in BU Science and Engineering Symposium, March 2012
- Michael Folk. "Dynamic Path-Based Piracy Prevention". Allegheny College Senior Project Celebration, April, 2007.

PROFESSIONAL ACTIVITIES

- Faculty Member, BU Center for Reliable Information Systems and Cyber Security (RISCS)
- Reviewer, IEEE Real-Time and Embedded Technology and Applications Symposium, 2011.
- Reviewer, IEEE Transactions on Computers, 2007, 2008.
- Reviewer, IEEE Real-Time and Embedded Technology and Applications Symposium, 2006.
- Reviewer, IEEE International Real-Time Systems Symposium, 2005, 2004.
- Reviewer, Euromicro Conference on Real-Time Systems, 2005.
- Reviewer, IEEE Symposium on Computers and Communications, 2004.
- IEEE member.

COMPUTER SKILLS

- OS: Linux/Unix and Windows
- Language: C/C++, Java, Perl, Tcl/Tk, Assembly(x86, MIPS), Shell Programming, Verilog
- Tools: Network Simulator (NS2), Ethereal, Matlab, R, Maxplus, Cadence EDA Tools

Yuting Zhang

- Virtualization Technology and Tools: VMware workstation, VMware ESX server, Xen, User-Mode Linux

AWARDS/HONORS

- RTSS Travel Grant Award, 2004.
- Grace Hopper Celebration of Woman in Computing Conference Travel Grant Award, provided by Microsoft, 2002.
- Excellent Master Thesis Award, Univ. of Science and Technology Beijing, 2001.
- Outstanding Undergraduate Student Award, Beijing, 1995.
- Named as "One of the Top Ten Students in Dept. of Computer Science at USTB", 1994 -1996.
- SONY scholarship, Beijing, 1994 -1995.

RERERENCES

Richard West
Associate Professor
Computer Science Department
Boston University
111 Cummington Street, Boston, MA 02215
Tel: (617) 353-2065
Email: richwest@cs.bu.edu

Azer Bestavros
Professor
Computer Science Department
Boston University
111 Cummington Street, Boston, MA 02215
Tel: (617) 353-9726
Email: best@cs.bu.edu

Robert Roos
Associate Professor and Chairman
Computer Science Department
Allegheny College
520 North Main Street, Meadville, PA 16335
Tel: (814) 332-2883
Email: rroos@allegheny.edu

Wayne Snyder
Associate Professor and Associate Dean
Computer Science Department
Boston University
111 Cummington Street, Boston, MA 02215
Tel: (617) 353-8926
Email: snyder@cs.bu.edu

Yuting Zhang