

Zoran Dimitrijević

Curriculum Vitae

Google Inc.
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Education

- June 2004 **Ph.D. in Computer Science**, University of California, Santa Barbara (UCSB).
Dissertation title: “Quality-of-Service Scheduling in Storage Systems”
Advisor: Prof. Edward Y. Chang.
- 2003 **M.S. in Computer Science**, University of California, Santa Barbara.
GPA: 4.00/4.00.
- 1999 **Dipl.Eng. in Electrical Engineering**, School of Electrical Engineering,
University of Belgrade, Serbia, Yugoslavia. GPA: 8.95/10.00.

Employment

- May 2004-present Google Inc., Mountain View, California.
- 1999-2004 Teaching and Research Assistant, CS and ECE Department, UCSB.
- Summer 2003 Instructor (Teaching Associate), CS Department, UCSB.
- Summer 2001 Research Scientist, Sony 550 Digital Media Ventures, San Francisco, California.
- Summer 2000 Research Intern, HP Labs, Palo Alto, California.
- 1998-1999 Research Assistant, CE&CS Department, University of Belgrade, Serbia.
- Fall 1997 Research Intern, ECE Department, University of Campinas, Brazil.

Research Interests

Design and implementation of large-scale storage systems, quality of service, parallel and cluster-based computing, multimedia systems, and large-scale search engines.

Research and Engineering Experience

Systems Infrastructure Group, Engineering and Research, Google Inc.
Mountain View, California, May 2004–present.

- Design and implementation of large-scale systems for Google.

Graduate Research Assistant for Prof. Edward Y. Chang, ECE Department, UCSB,
Santa Barbara, California, 2001–2004.

- Proposed preemptible disk scheduling algorithms. Investigated preemptibility of disk IOs. Designed and implemented *Semi-preemptible IO* prototype. Proposed and designed preemptive RAID scheduling algorithms. Designed IO preemption and resumption criteria. Implemented a simulator for preemptible RAID systems (*PraidSim*). Research in the areas of disk profiling, modeling, and data storage. Designed and implemented QoS extensions for Linux disk scheduling (*UCSB-IO*).
- Co-designed MEMS-based disk buffer for streaming media servers. Co-designed the analytical framework, admission-control criteria, and data-placement algorithms.
- Design and implementation of SfinX video surveillance system. Proposed the hardware and software architecture for SfinX. Co-designed and co-implemented Xstream video streaming and storage system. Investigated video streaming over wireless networks.

Research Scientist (Internship) for Dr. Sean Varah, Sony 550 Digital Media Ventures,
San Francisco, California, Summer 2001.

- Research in the design and implementation of real-time storage systems for streaming media.

Research Intern for Dr. Dejan Miložićić, HP Labs, Palo Alto, California, Summer 2000.

- Researched the susceptibility of operating systems and software to soft errors.

Teaching Experience

- Summer 2003 **Instructor (Teaching Associate)**, CS Department, Summer Sessions, UCSB.
CS170 Operating Systems (upper-division undergraduate course).
- Winter 2003 **Teaching Assistant for Prof. Tao Yang**, CS Department, UCSB.
CS240B High Performance Computing Systems and Applications (graduate-level course).
- Winter 2001 **Teaching Assistant for Prof. Peter Cappello**, CS Department, UCSB.
CS172 Software Engineering (upper-division undergraduate course).
- Fall 2000 **Teaching Assistant for Prof. Alan Konheim**, CS Department, UCSB.
CS176A Computer Networks (upper-division undergraduate course)
- Spring 2000 **Teaching Assistant for Prof. Klaus Schauer**, CS Department, UCSB.
CS290I Scalable Internet Services and Systems (graduate-level course).
- Winter 2000 **Teaching Assistant for Prof. Amr El Abbadi**, CS Department, UCSB.
CS130A Data Structures and Algorithms I (upper-division undergraduate course).
- Fall 1999 **Teaching Assistant for Prof. Anurag Acharya**, CS Department, UCSB.
CS170 Operating Systems (upper-division undergraduate course).

Publications

- [1] Zoran Dimitrijević. **Quality of service scheduling in storage systems**. Ph.D. Dissertation (ISBN 0-496-84077-0), Department of Computer Science, University of California, Santa Barbara, June 2004.

Journal Papers

- [2] Z. Dimitrijević, R. Rangaswami, and E. Chang. **Systems Support for Preemptive Disk Scheduling**. *IEEE Transactions on Computers*, pages 1314–1326, October 2005.
- [3] A. Messer, P. Bernadat, G. Fu, D. Chen, Z. Dimitrijević, D. Lie, D. Mannaru, A. Riska, and D. Milojičić. **Susceptibility of commodity systems and software to memory soft errors**. *IEEE Transactions on Computers*, pages 1557–1568, December 2004.
- [4] R. Rangaswami, Z. Dimitrijević, E. Chang, and S.-H. G. Chan. **Fine-grained device management in an interactive media server**. *IEEE Transactions on Multimedia*, pages 558–569, December 2003.

Conference Papers

- [5] B. Liu, R. Rangaswami, and Z. Dimitrijević. **Thwarting virtual bottlenecks in multi-bitrate streaming servers**. *Proceedings of IEEE Real-Time Systems Symposium (RTSS)*, December 2005.
- [6] R. Rangaswami, Z. Dimitrijević, K. Kakligian, E. Chang, and Y.-F. Wang. **The SfinX video surveillance system**. *Accepted to IEEE International Conference on Multimedia and Expo (ICME)*, June 2004.
- [7] Z. Dimitrijević, G. Wu, and E. Chang. **SFINX: A multi-sensor fusion and mining system (invited)**. *Proceedings of the IEEE Pacific-rim Conference on Multimedia*, Singapore, December 2003.
- [8] Z. Dimitrijević, R. Rangaswami, and E. Chang. **Design and implementation of Semi-preemptible IO**. *Proceeding of the Second Usenix File and Storage Technology (FAST)*, pages 145–158, San Francisco, California, March 2003.
- [9] R. Rangaswami, Z. Dimitrijević, E. Chang, and K. E. Schauer. **MEMS-based disk buffer for streaming media servers**. *Proceedings of the 19th IEEE International Conference on Data Engineering (ICDE)*, pages 619–630, Bangalore, India, March 2003.
- [10] Z. Dimitrijević, R. Rangaswami, and E. Chang. **Virtual IO: Preemptible disk access**.¹ *Proceedings of the 10th ACM Conference on Multimedia*, pages 231–234, Juan Les Pins, France, December 2002.

¹Extended version of this paper is published as Semi-preemptible IO [8].

- [11] Z. Dimitrijević, R. Rangaswami, and E. Chang. **The XTREAM multimedia system.** *Proceedings of IEEE Conference on Multimedia and Expo*, pages 545–548, Lausanne, Switzerland, August 2002.
- [12] D. Chen, A. Messer, P. Bernadat, G. Fu, Z. Dimitrijević, D. Lie, D. Mannaru, A. Riska, and D. Milojević. **JVM susceptibility to memory errors.** *Proceedings of Usenix Java[tm] Virtual Machine Research and Technology Symposium*, pages 67–77, Monterey, California, April 2001.

Technical Reports

- [13] B. Liu, R. Rangaswami, and Z. Dimitrijević. **Thwarting virtual bottlenecks in multi-bitrate streaming servers.** FIU Technical Report TR-2005-10-02, 2005.²
- [14] Z. Dimitrijević, R. Rangaswami, and E. Chang. **Preemptive RAID scheduling.** UCSB Technical Report TR-2004-19, 2004.
- [15] Z. Dimitrijević, R. Rangaswami, D. Watson, and A. Acharya. **Diskbench: User-level disk feature extraction tool.** UCSB Technical Report TR-2004-18, 2004.
- [16] A. Messer, P. Bernadat, G. Fu, D. Chen, Z. Dimitrijević, D. Lie, D. Mannaru, A. Riska, and D. Milojević. **Susceptibility of modern systems and software to soft errors.** *HP Labs Technical Report HPL-2001-43*, 2001.³

Other Publications

- [17] Z. Dimitrijević, R. Rangaswami, and E. Chang. **Architectural Support for Preemptive RAID schedulers.** Usenix FAST WiP Report/Poster, March, 2004.
- [18] Z. Dimitrijević. **Software environment for the simulation of distributed shared memory multiprocessor systems.** Engineering Diploma Thesis (in Serbian), School of Electrical Engineering, University of Belgrade, Serbia, July 1999.

(Full papers are available on-line at <http://www.cs.ucsb.edu/~zoran/applications/papers.html>.)

Selected Talks

- [1] **Google: organizing the world’s information... and loving it.** Google recruiting tech talk, University of Colorado at Boulder, October 2005.
- [2] **Google: a computer scientist’s playground.** Invited talk at Computer Science Department, FIU, Miami, April 2005.
- [3] **Two Pieces of Google Core Infrastructure: GFS and MapReduce.** Invited lecture for Prof. Rich Wolski’s CS290B Advanced Operating Systems course, UCSB, March 2005.
- [4] **Google: a computer scientist’s playground.** Invited talk at School of Electrical Engineering, University of Belgrade, Serbia, December 2004.
- [5] **Google: a computer scientist’s playground.** Invited talk at Innovative Computing Laboratory, University of Tennessee at Knoxville, October 2004.
- [6] **High-performance preemptible and MEMS-based IOs.** Invited talk at IBM Almaden Research Center, Almaden, California, November 2003.
- [7] **Design and implementation of Semi-preemptible IO.** Conference talk at Usenix FAST’03, San Francisco, California, April 2003.
- [8] **Multiprocessor systems.** Guest lecture for ECE154 Computer Architecture, UCSB, Winter 2003.
- [9] **I/O storage.** Guest lecture for ECE154 Computer Architecture, UCSB, Winter 2003.

²Subsequently published as a conference paper [5].

³Subsequently published as a journal paper [3].

- [10] **Virtual IO: Preemptible disk access.** Research seminar for Prof. Richard Muntz's group, UCLA, August 2002.
- [11] **The XTREAM multimedia system.** Research seminar (with Sony Research), UCSB, February 2002.
- [12] **Disk feature extraction.** Research seminar (with Sony Research), UCSB, Winter 2001.

Awards, Fellowships, Honors

- 2003 President's Work Study Award for 2003-2004, UCSB.
- 2002 Graduate Student Travel Grant, Graduate Division, UCSB.
- 1999 Dean's Fellowship, College of Engineering, UCSB.
- 1999 Teaching Assistantship and Tuition Fellowship for 1999-2003, CS Department, UCSB.
- 1993 Second place on the classification exam in Physics, University of Belgrade.
- 1988-1992 First place awards on Serbian state Physics competitions in 1988, 1990, and 1992.

Refereeing

Journals: *ACM Transactions on Storage*, *IEEE Transactions on Parallel and Distributed Systems*, *The Computer Journal* (published by Oxford University Press on behalf of British Computer Society), and *Software Practice and Experience* (published by John Wiley & Sons, Ltd.).

Conferences: *IEEE Infocom 2005*, *International Conference on Database Systems for Advanced Applications (DASFAA 2004)*, *IEEE Conference on Multimedia and Expo (ICME2004, ICME2005)*, *IEEE MMM 2006*, *ACM Multimedia 2006*.

Professional Meetings

1. *Sixth Usenix Operating Systems Design and Implementation (OSDI)*, San Francisco, California, December 2004.
2. *Third Usenix File and Storage Technology (FAST)*, San Francisco, California, March 2004.
3. *First ACM International Workshop on Video Surveillance*, Berkeley, California, November 7, 2003.
4. *11th ACM Multimedia*, Berkeley, California, November 2003.
5. *Second Usenix File and Storage Technology (FAST)*, San Francisco, California, March 2003.
6. *Workshop on Robustness Analysis Tools with Applications to the Biological and Physical Sciences: The Challenge of Complexity*, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, March 2003.
7. *10th ACM Multimedia*, Juan Les Pins, France, December, 2002.
8. *IEEE International Conference on Multimedia and Expo*, Lausanne, Switzerland, August, 2002.
9. *ACM SIGMOD/PODS*, Santa Barbara, California, May 2001.
10. *Java(tm) Virtual Machine Research and Technology Symposium*, Monterey, California, April, 2001.
11. *18th IEEE Symposium on Mass Storage Systems and Technologies (in cooperation with the Ninth NASA Goddard Conference on Mass Storage Systems and Technologies)*, San Diego, California, April, 2001.