

# Aleksandar Kuzmanovic

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Department of Electrical Engineering and Computer Science  
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## Research Interests

Computer networking with emphasis on design, measurements, analysis, denial-of-service resiliency, and prototype implementation of protocols and algorithms for the Internet.

## Education

Ph.D., Electrical and Computer Engineering August 2004  
Rice University, Houston, TX  
Thesis: *Edge-based Inference, Control, and Denial-of-Service Resilience for the Internet*  
Thesis Adviser: Dr. Edward W. Knightly

M.S., Electrical Engineering August 1999  
University of Belgrade, Belgrade, Serbia  
Thesis: *An Improved Flow Control Algorithm for the ITU-T T.125 Protocol*  
Thesis Adviser: Dr. Grozdan Petrovic

B.S., Electrical Engineering May 1996  
University of Belgrade, Belgrade, Serbia

## Honors and Awards

US Frontiers of Engineering (National Academy of Engineering), 2010, 2011.

Lisa Wissner-Slivka and Benjamin Slivka Chair in Computer Science, 2009 - present.

NSF CAREER Award, 2008.

Member of the Advisory Board of Narus Inc., 2008.

Searle Junior Fellow, Searle Center for Teaching Excellence, Northwestern University, 2007.

Microsoft Research Trustworthy Computing Award, 2006.

ACM SIGCOMM 2003 paper “*Low-Rate TCP-Targeted Denial of Service Attacks (The Shrew vs. the Mice and Elephants)*,” selected for forwarding to *IEEE/ACM Transactions on Networking* for fast-track publication, 2003.

Rice University Presidential Fellowship, 1999.

## Professional Experience

**Northwestern University**, Evanston, IL Jan. 2005-present  
*Associate Professor (tenured), Department of Electrical Engineering and Computer Science* Sept. 2010-present  
*Assistant Professor, Department of Electrical Engineering and Computer Science* Sept. 2005-Sept. 2010  
*Lisa Wissner-Slivka and Benjamin Slivka Chair in Computer Science* Sept. 2009-present  
*Assistant Professor, Department of Computer Science* Jan. 2005-Sept. 2005

**University of Electronic Science and Technology of China (UESTC)**, Chengdu, China Jan. 2009-present  
*Visiting Professor, School of Computer Science and Engineering*

**Rice University**, Houston, TX September 1999-December 2004  
*Research Assistant for Edward Knightly, Department of ECE* December 1999-December 2004  
Research in the area of computer networking and network security.

*Teaching Assistant, Department of ECE* January 2000-May 2003  
Teaching assistant and lecturer-on-call for various courses.

**Stanford Linear Accelerator Center (SLAC)**, Stanford, CA September 2003-October 2003  
*Visiting Researcher, SCS-Network Monitoring*  
Design, implementation, and evaluation of the *high-speed TCP - Low Priority* protocol.

**Ericsson Research**, Budapest, Hungary May 2001-August 2001  
*Intern, Traffic Analysis and Network Performance Laboratory*  
Development of an active probing scheme for available bandwidth estimation on an Internet path.

**Mihajlo Pupin Institute of Technology**, Belgrade, Serbia September 1997-September 1999  
*Research & Development Engineer, Telecommunications Department*  
Design and implementation of a High bit-rate Digital Subscriber Line (HDSL) modem.  
Design and implementation of a medium size Private Branch Exchange (PBX) switch.

**University of Belgrade**, Belgrade, Serbia October 1996-September 1999  
*Graduate Student, School of Electrical Engineering*  
Research in the area of reliable multicast.

**Algotech**, Belgrade, Serbia June 1996-September 1997  
*System Engineer*  
Consulting, installation, and maintenance of digital switching systems.

## Teaching

**Created EECS 395/495, Networking Problems in Cloud Computing**, Northwestern University, *Spring 2010, Spring 2011*  
A project-oriented class on networking problems in cloud computing.

**Created EECS 110 (Python), Introduction to Computer Programming (Python)**, Northwestern University, *Spring 2009, Spring 2010*  
Introduction to computer programming for non-majors.

**Created EECS 395/495, Measurement and Analysis of Online Social Networks**, Northwestern University, *Spring 2009*  
A project-oriented class on measurement and analysis of online social networks.

**Created EECS 395/495, Internet Architectures**, Northwestern University, *Spring 2007, Spring 2008*  
A project-oriented class on the future Internet design.

**Created EECS 440, Advanced Networking**, Northwestern University, *Spring 2005, Spring 2006*  
A project-oriented advanced networking class.

**EECS 340, Introduction to Networking**, Northwestern University, *Winter 2005, Winter 2007, Winter 2009, Winter 2011*  
A project-oriented (web application/TCP/routing) introduction to networking course.

**EECS 213, Introduction to Computer Systems**, Northwestern University, *Spring 2006, Spring 2008*  
A project-oriented introduction to computer systems course.

## Graduate Students / Visitors / Advising

### Ph.D. Students, Northwestern University

Marcel Flores, 2011 -  
Ning Xia, 2010 -  
Aaron Ballew (co-advised with C. C. Lee), 2008 -  
Ionut Trestian, 2007 -  
Ao-Jan Su, 2005 - 2011 (2011 -, TeleNav)  
Amit Mondal, 2005 - 2010, (2010 -, Google)  
Leiwen Deng, 2005 - 2010, (2010 -, Microsoft)

### Visiting Ph.D. Students, Northwestern University

Juan Bi, from UESTC, China, 2010 -  
Chunjing Xiao, from UESTC, China, 2010 -  
Zhen Qin, from UESTC, China, 2009 -  
Zuo Lin, from UESTC, China, 2009 - 2010  
Yong Wang, from UESTC, China, 2008 - 2010  
Gergely Biczok, from Ericsson Research, Fulbright Fellow, 2007-2008.

### Visiting Professors, Northwestern University

Michael Luo, from UESTC, China, 2011 - 2012.  
Cristina Nita-Rotaru, from Purdue University, USA, 2009.  
Jin Yuehui, from Beijing Post and Telecommunications University, China, 2009 - 2010.  
Gabriel Macia, from University of Granada, Spain, 2008.

## Publications

### Refereed Journal Articles

1. I. Trestian, S. Ranjan, A. Kuzmanovic, and A. Nucci, "Taming the Mobile Data Deluge with Drop Zones," accepted, *IEEE/ACM Transactions on Networking*, September, 2011.
2. Z. Li, A. Goyal, Y. Chen, and A. Kuzmanovic, "Measurement and Diagnosis of Address-Misconfigured P2P Traffic," *IEEE Network Magazine*, March/April, 2011.
3. I. Trestian, S. Ranjan, A. Kuzmanovic, and A. Nucci, "Googling the Internet: Profiling Internet Endpoints via the World Wide Web," accepted, *IEEE/ACM Transactions on Networking*, June, 2009.
4. A. Mondal and A. Kuzmanovic, "Upgrading Mice to Elephants: Effects and End-Point Solutions," accepted, *IEEE/ACM Transactions on Networking*, May, 2009.
5. A.-J. Su, D. Choffnes, A. Kuzmanovic, and F. Bustamante, "Drafting Behind Akamai: Inferring Network Conditions Based on CDN Redirections," accepted, *IEEE/ACM Transactions on Networking*, February, 2009.
6. A. Mondal and A. Kuzmanovic, "Removing Exponential Backoff from TCP," in *ACM SIGCOMM Computer Communication Review*, Volume 38, Number 5, October 2008.
7. L. Deng, Y. Gao, Y. Chen, and A. Kuzmanovic, "Pollution Attacks and Defenses for Internet Caching Systems," in *Journal of Computer Networks*, 52(5): 935-956, April 2008.
8. A. Kuzmanovic and E. Knightly, "Receiver-Driven Congestion Control with a Misbehaving Receiver: Vulnerabilities and End-Point Solutions," in *Journal of Computer Networks*, 51(10): 2717-2737, July 2007.
9. A. Kuzmanovic and E. Knightly, "TCP-LP: Low Priority Service via End-Point Congestion Control," in *IEEE/ACM Transactions on Networking*, 14(4), August 2006.

10. A. Kuzmanovic and E. Knightly, "Low-Rate TCP-Targeted Denial of Service Attacks and Counter Strategies," in *IEEE/ACM Transactions on Networking*, 14(4), August 2006.
11. A. Kuzmanovic and E. Knightly, "Measurement-Based Characterization and Classification of QoS-Enhanced Systems," in *IEEE Transactions on Parallel and Distributed Systems*, 14(4), April 2003.

#### Editorial Journal Articles

12. C. Dovrolis, K. Gummadi, A. Kuzmanovic, and S. Meinrath, "Measurement Lab: Overview and an Invitation to the Research Community," in *ACM SIGCOMM Computer Communication Review*, Volume 40, Number 3, July 2010.

#### Refereed Conference Publications

13. Y. Wang, K. Pal, and A. Kuzmanovic, "Understanding Crowds' Migration on the Web," in *Proceedings of IEEE/WIC/ACM International Conference on Web Intelligence*, Lyon, France, August 2011. (8 pages, acceptance rate 20%, 41/200)
14. A. Ballew, A. Kuzmanovic, and C.C. Lee, "Fusion of Live Audio Recordings for Blind Noise Reduction," in *Proceedings of FUSION*, Chicago, IL, July 2011. (7 pages, acceptance rate NA)
15. Y. Wang, D. Burgener, A. Kuzmanovic, and G. Macia, "Understanding the Network and User-Targeting Properties of Web Advertising Networks," in *Proceedings of IEEE ICDCS*, Minneapolis, MN, June 2011. (12 pages, acceptance rate 15%, 15/99)
16. Y. Wang, D. Burgener, M. Flores, A. Kuzmanovic, and C. Huang, "Towards Street-Level Client Independent IP Geolocation," in *Proceedings of USENIX NSDI*, Boston, MA, March 2011. (14 pages, acceptance rate 17%, 27/157)
17. I. Trestian, S. Ranjan, A. Kuzmanovic, and A. Nucci, "Taming User-Generated Content in Mobile Networks via Drop Zones," in *Proceedings of IEEE INFOCOM*, Shanghai, China, April 2011. (9 pages, acceptance rate 16%, 291/1823)
18. A.-J. Su, Y. C. Hu, A. Kuzmanovic, and C.-k. Koh, "How to Improve Your Google Ranking: Myths and Reality," in *Proceedings of IEEE/WIC/ACM International Conference on Web Intelligence*, Toronto, Canada, 2010. (8 pages, acceptance rate 16%, 52/313)
19. A. Mondal, R. Cutler, C. Huang, J. Li, and A. Kuzmanovic, "SureCall: Towards Glitch-Free Real-Time Audio/Video Conferencing," in *Proceedings of IEEE IWQoS*, Beijing, China, 2010. (9 pages, acceptance rate 24%, 33/133)
20. G. Macia, Y. Wang, R. Rodriguez, and A. Kuzmanovic, "ISP-Enabled Behavioral Ad Targeting without Deep Packet Inspection," in *Proceedings of IEEE INFOCOM*, San Diego, CA, 2010. (9 pages, acceptance rate 17%, 276/1575)
21. Z. Li, A. Goyal, Y. Chen, and A. Kuzmanovic, "Measurement and Diagnosis of Address-Misconfigured P2P Traffic," in *Proceedings of IEEE INFOCOM*, San Diego, CA, 2010. (9 pages, acceptance rate 17%, 276/1575)
22. I. Trestian, S. Ranjan, A. Kuzmanovic, and A. Nucci, "Measuring Serendipity: Connecting People, Locations and Interests in a Mobile 3G Network," in *Proceedings of ACM SIGCOMM Internet Measurement Conference (IMC)*, Chicago, IL, 2009. (13 pages, acceptance rate 22%, 41/183)

23. A. Mondal, P. Sharma, S. Banerjee, and A. Kuzmanovic, "Supporting Application Network Flows with Multiple QoS Constraints," in *Proceedings of IEEE IWQoS 2009*, Charleston, South Carolina, July 2009. (10 pages, acceptance rate 35%, 28/80)
24. A.-J. Su and A. Kuzmanovic, "Thinning Akamai," in *Proceedings of USENIX/ACM SIGCOMM Internet Measurement Conference (IMC)*, Vouliagmeni, Greece, October 2008. (12 pages, 17% acceptance rate, 32/185)
25. L. Deng and A. Kuzmanovic, "Monitoring Persistently Congested Internet Links," in *Proceedings of IEEE ICNP 2008*, Orlando, FL, October 2008. (10 pages, 16% acceptance rate, 33/202)
26. I. Trestian, S. Ranjan, A. Kuzmanovic, and A. Nucci, "Unconstrained Endpoint Profiling (Googling the Internet)," in *Proceedings of ACM SIGCOMM 2008*, Seattle, WA, August 2008. (12 pages, 12% acceptance rate, 36/288)
27. A.-J. Su, D. Choffnes, F. Bustamante, and A. Kuzmanovic, "Relative Network Positioning via CDN Redirections," in *Proceedings of ICDCS 2008*, Beijing, China, June 2008. (10 pages, 16% acceptance rate, 102/638)
28. A. Mondal and A. Kuzmanovic, "A Poisoning-Resilient TCP Stack," in *Proceedings of IEEE ICNP 2007*, Beijing, China, October 2007. (10 pages, 14% acceptance rate, 32/220)
29. A. Mondal and A. Kuzmanovic, "When TCP Friendliness Becomes Harmful," in *Proceedings of IEEE INFOCOM 2007*, Anchorage, Alaska, May 2007. (9 pages, 18% acceptance rate, 252/1404)
30. Y. Gao, L. Deng, A. Kuzmanovic, and Y. Chen, "Internet Cache Pollution Attacks and Countermeasures," in *Proceedings of IEEE ICNP 2006*, Santa Barbara, CA, November 2006. (10 pages, 14% acceptance rate, 33/232)
31. A.-J. Su, D. Choffnes, A. Kuzmanovic, and F. Bustamante, "Drafting Behind Akamai (Travelocity-Based Detouring)," in *Proceedings of ACM SIGCOMM 2006*, Pisa, Italy, September 2006. (12 pages, 10% acceptance rate, 37/340)
32. A. Kuzmanovic, "The Power of Explicit Congestion Notification," in *Proceedings of ACM SIGCOMM 2005*, Philadelphia, PA, August 2005. (12 pages, 10% acceptance rate, 27/255)
33. D. Dumitriu, E. Knightly, A. Kuzmanovic, I. Stoica, and W. Zwaenepoel, "Denial-of-Service Resilience in Peer-to-Peer File Sharing Systems," in *Proceedings of ACM SIGMETRICS 2005*, Banff, Alberta, Canada, June 2005. (12 pages, 13% acceptance rate, 31/237)
34. A. Kuzmanovic and E. Knightly, "A Performance vs. Trust Perspective in the Design of End-Point Congestion Control Protocols," in *Proceedings of IEEE ICNP 2004*, Berlin, Germany, October 2004. (12 pages, 15% acceptance rate, 33/213)
35. A. Kuzmanovic and E. Knightly, "Low-Rate TCP-Targeted Denial of Service Attacks (the Shrew vs. the Mice and Elephants)," in *Proceedings of ACM SIGCOMM 2003*, Karlsruhe, Germany, August 2003. (12 pages, 10% acceptance rate, 33/319)
36. A. Kuzmanovic and E. Knightly, "TCP-LP: A Distributed Algorithm for Low Priority Data Transfer," in *Proceedings of IEEE INFOCOM 2003*, San Francisco, CA, April 2003. (11 pages, 20% acceptance rate, 224/1078)

37. A. Kuzmanovic and E. Knightly, "Measuring Service in Multi-Class Networks," in *Proceedings of IEEE INFOCOM 2001*, Anchorage, Alaska, April 2001. (9 pages, 23% acceptance rate, 192/830)

#### **Refereed Workshop Publications**

38. J. Scott Miller, A. Mondal, R. Potharaju, P. Dinda, and A. Kuzmanovic, "Understanding End-User Perception of Network Problems," in *Proceedings of ACM SIGCOMM Workshop on Measurements Up the Stack (W-MUST)*, Toronto, CA, August 2011.
39. A. Kuzmanovic, E. Knightly, and R. Les Cottrell, "HSTCP-LP: A Protocol for Low-Priority Bulk Data Transfer in High-Speed High-RTT Networks," in *Proceedings of PFLDnet 2004*, Argonne, IL, February 2004.

#### **Refereed Poster Publications**

40. Y. Wang, D. Burgener, A. Kuzmanovic, and G. Macia, "Analyzing Content-Level Properties of the Web Adversphere," in *Proceedings of WWW 2010*, Raleigh, NC, April 2010.
41. G. Biczok, W. Young, and A. Kuzmanovic, "Monitoring Network Bias," in *Proceedings of ACM SIGCOMM 2008*, Seattle, WA, August 2008.
42. L. Deng and A. Kuzmanovic, "Pong: Diagnosing Spatio-Temporal Internet Congestion Properties," in *Proceedings of ACM SIGMETRICS 2007*, San Diego, CA, June 2007. (2 pages, 28% acceptance rate, (29 papers + 19 posters)/170)

#### **Standards-related Documents**

43. A. Kuzmanovic, A. Mondal, S. Floyd, and K.K. Ramakrishnan "Adding Explicit Congestion Notification (ECN) Capability to TCP's SYN-ACK Packets," RFC 5562, June 2009. (available at: <http://www.ietf.org/rfc/rfc5562.txt>)

#### **Un-refereed Publications (not duplicating the above)**

44. L. Deng and A. Kuzmanovic, "A Feeder-Carrier-Based Internet User Accountability Service," *Tech. Report NWU-EECS- 09-12, Department of EECS, Northwestern University*, May 2009.
45. L. Deng, A. Kuzmanovic, and B. Davie, "Understanding Congestion in the Internet Core," *Tech. Report NWU-EECS-07-12, Department of EECS, Northwestern University*, October 2007.
46. D. Choffnes, J. Lange, S. Rossoff, and A. Kuzmanovic, "On the Use of Parallel Connections in Web Browsers," *Tech. Report NWU-EECS- 06-15, Department of EECS, Northwestern University*, October 2006.

#### **Patent applications**

47. G. Macia, Y. Wang, R. Rodriguez, and A. Kuzmanovic, "Extracting User Web Browsing Patterns from Non-Content Records of Online Communications," filed on Apr 17, 2009, U.S. Patent application no. 61/170,226.
48. L. Deng and A. Kuzmanovic, "IDnet Mesh: a Universal Identity Solution for the Internet," filed on Oct 08, 2008, U.S. Patent application no. 61/103,672.

## Software Distribution

**Pong, a congestion monitoring system**, downloadable from:

<http://networks.cs.northwestern.edu/pong/>

A tool for locating congestion points and tracing congestion status in the Internet, May, 2008.

**AE, an anti-pollution engine system**, downloadable from:

<http://networks.cs.northwestern.edu/AE/>

The Anti-pollution Engine (AE) system is an extension for the Squid Web cache to counter cache-target DoS attacks, May, 2007.

**TCP Low Priority**, downloadable from:

<http://cs.northwestern.edu/~akuzma/rice/TCP-LP/>

TCP Low Priority (TCP-LP) has become a part of the Linux operating system and is being distributed for Linux kernel 2.6.14 and above, September, 2006.

## Talks

### Invited

CCW 2011 (*invited, hosts: Prof. Ibrahim Matta and Lixin Gao*), “Skynet: A Cloud-Hopping Data Transfer Architecture,” Hyannis, Cape Cod, MA, October 2011.

Columbia University (*invited, host: Prof. Dan Rubenstein*), “Towards Street-Level Client-Independent IP Geolocation,” New York, NY, September 2010.

Indiana University (*invited, host: Prof. Minaxi Gupta*), “User-Driven Indoor Visibility Localization with Wayfinding,” Bloomington, IN, March 2010.

University of Toronto (*invited, host: Prof. Jorg Liebeherr*), “ISP-Enabled Behavioral Ad Targeting without User Consent (and Beyond),” Toronto, Canada, September 2009.

Telefonica Research (*invited, host: Dr. Pablo Rodriguez*), “ISP-Enabled Behavioral Ad Targeting without User Consent (and Beyond),” Barcelona, Spain, August 2009.

Microsoft Research (*invited, host: Dr. Jin Li*), “ISP-Enabled Behavioral Ad Targeting without User Consent (and Beyond),” Redmond, WA, June 2009.

University of Massachusetts Amherst (*invited, host: Prof. Lixin Gao*), “Googling the Internet (and Beyond),” Amherst, MA, February 2009.

Boston University (*invited, host: Prof. Ibrahim Matta*), “Googling the Internet (and Beyond),” Boston, MA, February 2009.

Google Inc. (*invited, host: Brian Fitzpatrick*), “Googling the Internet (and Beyond),” Chicago, IL, November 2008.

MIT (*invited, host: Prof. Dina Katabi*), “Googling the Internet (and Beyond),” Cambridge, MA, October 2008.

CCW 2008 (*invited, host: Prof. Christos Papadopoulos*), The IEEE 22st Annual Computer Communications Workshop, “Google-based Traffic Classification,” Steamboat Springs, CO, October 2008.

Purdue University (*invited, host: Prof. Y. Charlie Hu*), “Googling the Internet (and Beyond),” West Lafayette, IN, September 2008.

Motorola Inc. (*invited, host: Dr. Ivan Vukovic*), “From TCP to Net Neutrality and Back,” Arlington Heights, IL, November 2007.

University of Electronic Science & Technology of China (UESTC), (*invited, host: Prof. Qin Zhinguang, Dean*), “Northwestern Networks Group Research,” Chengdu, China, October 2007.

Washington University (*invited, host: Prof. Sergey Gorinsky*), “From TCP to Net Neutrality and Back,” St. Louis, MO, September 2007.

HP Labs (*invited, host: Dr. Sujata Banerjee*), “From TCP to Net Neutrality and Back,” Palo Alto, CA, August 2007.

Rice University (*invited, host: Prof. Edward W. Knightly*), “Diagnosing Spatio-Temporal Internet Congestion Properties,” Houston, TX, May 2007.

University of Granada (*invited, host: Prof. Gabriel Macia*), “Towards Robust Protocol Design: Four Ways to Kill TCP without Much Trouble,” Granada, Spain, April 2007.

CCW 2007 (*invited, host: Prof. Taieb Znati*), The IEEE 21st Annual Computer Communications Workshop, “Diagnosing Spatio-Temporal Internet Congestion Properties,” Pittsburgh, PA, February 2007.

Georgia Tech (*invited, host: Prof. Constantine Dovrolis*), “Drafting Behind Akamai (Travelocity-Based Detouring),” Atlanta, Georgia, May 2006.

DePaul University (*invited, host: Prof. Ehab Al-Shaer*), “The Power of Explicit Congestion Notification (and More),” Chicago, IL, November 2005.

EPFL (*invited, host: Prof. Edward W. Knightly*), “Low-Rate TCP-Targeted Denial of Service Attacks,” Lausanne, Switzerland, August 2003.

SLAC labs (*invited, host: Dr. R. Les Cottrell*), “TCP-LP: A Distributed Protocol for Low-Priority Data Transfer,” Palo Alto, CA, April 2003.

#### **Conferences / Seminars**

WI 2011, “Understanding Crowds’ Migration on the Web,” Lyon, France, August 2011.

NSDI 2011, “Towards Street-Level Client-Independent IP Geolocation,” Boston, MA, April 2011.

CUCIS (Center for Ultrascale Computing and Information Security), “User-Driven Indoor Visibility Localization with Wayfinding,” Northwestern University, Evanston, IL, April 2010.

NICO (Northwestern Institute on Complex Systems), “The Genesis of Location-Aware Mobile Social Networking,” Northwestern University, Evanston, IL, March 2009.

Rutgers University, “What Lies Beneath: Understanding Internet Congestion,” DIMACS/DyDAn Workshop on Internet Tomography, Piscataway, NJ, May 2008.

EECS Meet the Faculty Seminar Series, “Stories from the Networks Group,” Northwestern University, Evanston, IL, June 2007.

Searle Fellows Program, “Benefiting from Learners’ Diversity,” (*a joint presentation with Adilson Motter, Dept. of Physics and Astronomy*), Northwestern University, Evanston, IL, May 2007.

Motorola Security Workshop, “Countering Large-Scale Internet Pollution and Poisoning,” Northwestern University, Evanston, October 2006.

SIGCOMM 2005, “The Power of Explicit Congestion Notification,” Philadelphia, PA, August 2005.

ICNP 2004, “A Performance vs. Trust Perspective in the Design of End-Point Congestion Control Protocols,” Berlin, Germany, October 2004.

PFLDnet 2004, “HSTCP-LP: A Protocol for Low-Priority Bulk Data Transfer in High-Speed High-RTT Networks,” Argonne, IL, February 2004.

SIGCOMM 2003, “Low-Rate TCP-Targeted Denial of Service Attacks (The Shrew vs. the Mice and Elephants),” Karlsruhe, Germany, September 2003.

INFOCOM 2003, "TCP-LP: A Distributed Protocol for Low-Priority Data Transfer," San Francisco, CA, April 2003.

INFOCOM 2001, "Measuring Service in Multi-Class Networks," Anchorage, Alaska, April 2001.

## Grants

Co-PI (with Jian Cao and Kornel Ehmann (Northwestern U.)), "Cloud-Computing and High-Speed Internet Enabled Manufacturing," NSF EAGER Program, Award 1148709, 2011-2012, \$100K.

PI (with Y. Charlie Hu (Purdue U.) and Doug Downey (Northwestern U.)), "Auditing Internet Content for Credibility, Fairness, and Privacy," NSF NetSE Program, Award CNS-1064595, 2011-2015, \$826K.

PI, "Persona: Understanding Mobile User Behavior," Narus Research Fellows Program, Narus Inc., 2011, \$30K.

PI, "Taming User-Generated Content in Mobile Networks via Drop Zones," Narus Research Fellows Program, Narus Inc., 2010, \$25K.

PI, "Serendipitous Location-Based Mobile Services," Narus Research Fellows Program, Narus Inc., 2009, \$25K.

PI, "Googling the Internet," Narus Research Fellows Program, Narus Inc., 2008, \$25K.

PI, "Internet Audit: A Theory, Toolset, and Applications for a World without Net Neutrality," NSF CAREER Program, Award CNS-0746360, 2008-2013, \$450K.

PI, "Diagnosing Spatio-Temporal Internet Congestion Properties," Cisco Collaborative Research Initiative, Cisco Sponsor: Bruce Davie, 2007-2008, \$94K.

PI (with Y. Chen (Northwestern U.)), "Pollution Resilience for Internet Caches," NSF Cyber Trust Program, Award CNS-0627715, 2006-2009, \$350K.

Co-PI (with Y. Chen, F. Bustamante, and P. Dinda (Northwestern U.)), "Integrated Modular Trustworthy Computing Curriculum Development Proposal," Microsoft Research Trustworthy Computing Award, 2006-2007, \$50K.

Co-PI (with F. Bustamante, P. Dinda, B. Dennis, and Y. Chen (Northwestern U.)), "A Virtual Lab for Experimental Systems in Education," Walter P. Murphy Society Grant, Northwestern University, 2005-2006, \$37K.

## Collaborators

### Northwestern University

C. C. Lee (EECS)  
Randy Berry (EECS)  
Fabian Bustamante (EECS)  
Yan Chen (EECS)  
Alok Choudhary (EECS)  
Peter Dinda (EECS)  
Gokhan Memik (EECS)  
Seda Memik (EECS)  
Alan Sahakian (EECS)  
Larry Henschen (EECS)  
Brian Uzzi (Kellogg)

### Worldwide

Sujata Banarjee (HP Labs)  
R. Les Cottrell (SLAC)  
Bruce Davie (Cisco Systems)  
Sally Floyd (ICSI Center for Internet Research)  
Manish Jain (Microsoft Research)  
Y. Charlie Hu (Purdue University)  
Cheng Huang (Microsoft Research)  
Jin Li (Microsoft Research)  
Gabriel Macia (University of Granada, Spain)  
Antonio Nucci (Narus Inc.)  
K.K. Ramakrishnan (AT&T Research)  
Supranamaya Ranjan (Narus Inc.)  
Puneet Sharma (HP Labs)  
Ion Stoica (UC Berkeley)  
Willy Zwaenepoel (EPFL)

## **Professional Service**

### **Chair**

*Semantic Processing* session chair, 2011 U.S. Frontiers of Engineering (National Academy of Engineering).  
*Data centers and cloud computing* session organizer and chair, the IEEE 25th Annual Computer Communications Workshop, CCW 2011.  
Workshops Chair, ACM SIGCOMM CoNEXT Conference 2010.  
Local arrangements co-chair, Internet Measurement Conference 2009.  
Track Co-Chair, Track on Internet Services, Systems and Applications (ISSA), IEEE ICCCN 2009.  
Publications co-chair, IEEE INFOCOM 2008.  
Finance Chair, IEEE IWQoS 2007.  
Workshops Co-chair, IEEE INFOCOM 2007.  
INFOCOM TPC meeting co-organizer, Evanston, IL, November 2006.

### **Steering and program committees**

Program Committee member, IEEE ICDCS 2012.  
Program Committee member, IEEE INFOCOM 2012.  
Program Committee member, IEEE ICNP 2011.  
Program Committee member, IEEE ICDCS 2011.  
Program Committee member, PAM 2011.  
Program Committee member, IEEE INFOCOM 2011.  
Program Committee member, IEEE ICNP 2010.  
Program Committee member, IEEE INFOCOM 2010.  
Steering Committee member, Measurement Lab, <http://www.measurementlab.net/>  
Program Committee member, PFLDNet 2009.  
Program Committee member, IEEE ICNP 2009.  
Program Committee member, IEEE INFOCOM 2009.

Program Committee member, Secure Network Protocols (NPsec) 2008.

Program Committee member, IEEE ICNP 2008.

Program Committee member, IEEE Broadnets 2008.

Program Committee member, Future Internet Architectures and Protocols Symposium 2008.

Program Committee member, IEEE INFOCOM 2008.

Student Workshop Program Committee member, ACM CoNEXT 2007.

Program Committee member, Secure Network Protocols (NPsec) 2007.

Poster Program Committee member, ACM SIGCOMM 2007.

Program Committee member, Hot Topics in Autonomic Computing (HotAC) 2007.

Program Committee member, IEEE IWQoS 2007.

Program Committee member, IEEE INFOCOM 2007.

Program Committee member, IEEE INFOCOM 2006.

### **Panels**

NSF CISE Panelist and Reviewer 2010.

NSF CISE Panelist and Reviewer 2008.

NSF CISE Panelist and Reviewer, 2005.

### **Refereeing**

Referee for ACM SIGCOMM, USENIX NSDI, ACM SIGMETRICS, IEEE INFOCOM, IEEE IWQoS, IEEE ICNP, ACM MOBICOM, IEEE/ACM Transactions on Networking, ACM Transactions on Computer Systems, Computer Communication Review, ACM Transactions on Information and System Security, Journal of Communications and Networks, Journal of Computer Networks, IEEE Transactions on Signal Processing, and others.

### **Private**

Serbian citizen, US permanent resident.