

## MARK E. CROVELLA

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Date of Birth: October 28, 1959  
Location: Buffalo, New York, USA  
Nationality: USA

Current as of June 28, 2018

### EDUCATION

- Ph.D.** Computer Science, University of Rochester, October 1994.
- M.S.** University of Rochester, May 1991.
- M.S.** State University of New York at Buffalo, May 1990.
- B.S.** Cornell University, May 1982.

### PROFESSIONAL EXPERIENCE

- Professor** Department of Computer Science, Boston University. **Department Chair** July 2013 to June 2018; **Professor** September 2006 to present; **Associate Professor** September 2000 – September 2006; **Assistant Professor** September 1994 – September 2000. On leave September 2000 to September 2001.
- Affiliated Faculty** Department of Electrical and Computer Engineering, Graduate Program in Bioinformatics, Center for Information Systems and Engineering, and Division of Systems Engineering, Boston University.
- Chief Scientist** Guavus, Inc., February 2012 to August 2014.
- Visiting Associate Professor** Laboratoire d'Informatique de Paris 6 (LIP6). August 2003 to August 2004.
- Technical Director** Network Appliance, Tewksbury, MA. November 2000 to April 2002.
- Chief Architect** Webmanage Technologies, Chelmsford, MA. May 2000 to acquisition by Network Appliance in November 2000.
- Lead Research Scientist** epicRealm, Inc., Richardson, TX. January to May 2001.
- Senior Computer Scientist** Calspan Corporation, Buffalo, NY. August 1984 to August 1994.

### HONORS

- Distinguished Alumni Award**, 2017, University at Buffalo, Department of Computer Science and Engineering.
- Innovator of the Year**, 2014, Boston University.
- IETF/IRTF Applied Networking Research Prize** for “Routing State Distance: A Path-based Metric for Network Analysis,” ACM Internet Measurement Conference (IMC), 2012.
- Best Student Paper Award** for “Intrusion as (Anti)social Communication: Characterization and Detection,” ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2012.
- IEEE Fellow**, 2011, “For contributions to the measurement and analysis of networks and distributed systems.”

**ACM Fellow**, 2010, “For contributions to the measurement and analysis of networks and distributed systems.”

**ACM SIGMETRICS Test of Time Award** for “Self-Similarity in World Wide Web Traffic: Evidence and Possible Causes,” (with Azer Bestavros). One of the three inaugural Test of Time Awards given by SIGMETRICS in 2010. The award is given for a paper published between 1973 and 1999 that has had the greatest impact over the subsequent period.

**CNRS Fellowship**, Centre National de la Recherche Scientifique (Department Sciences et Technologies de l’Information et de la Communication), for 2003-2004 academic year as Visiting Associate Professor at Laboratoire d’Informatique de Paris 6 (LIP6).

**NSF CAREER Award**, 1995.

**ARPA Fellowship in High Performance Computing**, 1993-1994.

**DARPA Parallel Processing Fellowship**, 1992-1993.

#### EDITORIAL BOARDS

**Steering Committee**, IEEE Transactions on Network Science and Engineering, 2016–present.

**Editor**, Computer Communication Review, 2005 – 2008.

**Editor**, Computer Networks, 2004 – 2005.

**Editor**, IEEE/ACM Transactions on Networking, 2000 – 2006.

**Editor**, IEEE Transactions on Computers, 2000 – 2004.

#### FUNDING

“Traveling Back to the Future: Using Network Science to Unravel Evolutionary Conserved RNA Binding Proteins and Complexes Associated with Disease,” BU Hariri Institute Research Incubation Award, 2/9/18, \$35,280.

“Analytic Tools for Evolving Path-based Networks,” NSF CISE/CNS NeTS Small, 8/15/16 – 7/31/19, \$499,951.

“Structural Matrix Completion for Data Mining Applications,” NSF CISE/III Small, 9/1/14 – 8/31/17, \$499,702 with 1 other PI.

“Understanding Communication Strategies for Ad Hoc Networks,” NSF CISE/CNS NeTS Small, 8/1/11 – 7/31/14, \$390,853.

“Information and Software Assurance: A Coordinated Approach to Cyber-Situation Awareness Based on Traffic Anomaly Detection,” DoD ARO, 9/1/2011 - 8/31/2015, \$800,000 with 3 other PIs.

“Securing the Open Softphone,” NSF CISE/CNS TC Large, 7/1/10 – 6/30/15, \$2,992,896, with 8 other PIs. REU Supplement, 4/13/11 – \$73,125.

“New Directions in Network Dimensionality Reduction for Routing and Beyond,” NSF CISE/CNS NeTS Small, 7/1/10 – 6/30/13, \$450,000.

“Wide-Aperture Traffic Analysis for Internet Security,” NSF CISE/CNS TC Medium, 9/1/09 – 8/31/13, \$723,053, with 2 other PIs.

Sponsoring Advisor for Postdoctoral Fellow under the *Computing Innovations Fellowship Program*, NSF CIF, 9/1/09 – 8/31/11, \$267,500.

“Passive Methods for Internet Topology Discovery,” National Geospatial Intelligence Agency, 8/1/09 – 7/31/12, \$360,000.

“Instrumentation and Measurement for GENI,” NSF/BBN, 8/1/08 – 8/31/11, \$80,932

“Whole-Network Anomaly Diagnosis,” Intel, 1/1/05 – 12/31/07, \$158,000.

“Coordinate Systems for the Internet,” NSF CISE/ANI, 8/15/03 – 7/31/06, \$222,035.

“Collaborative Research: Modular Strategies for Global internetwork Monitoring,” with 6 other PIs, NSF CISE/CCR ITR, 9/1/03 – 8/31/08, \$1,994,513.

- “Research Support for IP Network Characterization,” Sprint Advanced Technology Laboratories, 9/1/03 – 8/31/04, \$29,592.
- “Research Support for IP Network Characterization,” with 3 other PIs, Sprint Advanced Technology Laboratories, 9/1/02 – 8/31/03, \$80,000.
- “A Control Theoretic Approach to the Design of Internet Traffic Managers,” with 3 other PIs, NSF CISE/ANIR, 9/1/01 – 8/31/05, \$719,994.
- “Diagnosis and Control of Network Variability by Massively Accessed Servers,” with 2 other Principal Investigators, NSF CISE/ANI, 9/1/00 – 8/31/05, \$1,210,768.
- “Wide Area Web Measurement,” GTE Laboratories, 9/1/00 – 8/31/01, \$20,000.
- “Wide Area Web Measurement,” Xerox PARC, 9/1/99 – 8/31/00, \$15,000.
- “COMMONWEALTH: Architecture and Protocols for Scalable WWW Service,” with 2 other Principal Investigators, NSF CISE/CCR Experimental Software Systems, 7/15/97 – 6/30/00, \$590,087.
- “Research Support for Network Performance Characterization, Analysis, and Evaluation,” Principal Investigator, Hewlett-Packard Company, 9/1/96 – 9/1/97: \$69,404. Renewed for 9/1/97 – 9/1/98: \$88,154. Renewed for 9/1/98 – 9/1/99: \$29,873.
- “Practical Performance Prediction for Parallel Programmers,” Principal Investigator, NSF CISE/CCR CAREER, 9/1/95 – 5/31/98, \$91,066
- “Research Infrastructure for Parallel and Distributed Systems: Real-Time, Multimedia, and High-Performance,” with 4 other Principal Investigators, NSF CISE Institutional Infrastructure, \$874,019
- “Research Instrumentation for Real-Time, Multimedia and High-Performance Computing in Distributed Systems,” with 4 other Principal Investigators, NSF CISE IGR, \$142,744
- “Graduate Assistantships in High Performance Computing,” with 5 other Principal Investigators, US Dept. of Education, 9/1/95 – 8/31/98, \$354,645

#### PROFESSIONAL AFFILIATIONS

Association for Computing Machinery (Fellow)  
 IEEE (Fellow)  
 ACM SIGCOMM and SIGMETRICS  
 IEEE Computer Society and Communication Society

#### INVITED CONFERENCE TALKS

- Keynote Speaker, *IEEE Workshop on Data Science for Networking (DS4N)*, Boston, MA, December 14, 2017.
- Invited Panelist, *CSE 50th Anniversary Celebration*, University at Buffalo, Department of Computer Science and Engineering, September 30, 2017.
- Keynote Speaker, *DATANET 16: Workshop on Data-Driven Networking*, Arizona State University, May 13, 2016.
- Invited Speaker, *Workshop on Mathematics of Data Analysis in Cybersecurity*, ICERM, Brown University, October 24, 2014.
- Invited Speaker, *51st Annual Allerton Conference on Communication, Control, and Computing*, University of Illinois at Urbana-Champaign, October 3, 2013.
- Invited Speaker, *Network Links: Connecting Social, Communication and Biological Network Analysis*, Institute for Mathematics and its Applications (IMA), Minneapolis, MN, February 29, 2012.
- Invited Speaker, *Statistics of Networks Workshop*, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, June 24-25, 2010.
- Keynote Speaker, *NetEval 2009 Workshop, The First Workshop on Performance Evaluation of Next-Generation Networks*, Boston, MA, April 26, 2009.

- Keynote Speaker, *2006 Euro-NGI Workshop on Visions of Future Generation Networks (EuroView2006)*, Würzburg, Germany, August 1, 2006.
- Invited Speaker, *Maryland Hybrid Networks Center*, Advanced Networks Colloquium Series, University of Maryland, December 16, 2005.
- Keynote Speaker, *Workshop on End-to-End Monitoring Techniques and Services (E2EMON)*, Nice, France, May 15, 2005.
- Invited Speaker, *Workshop on Internet Measurement, Modeling, and Analysis*, Statistical Research Center for Complex Systems (SRCCS), Seoul National University, Seoul, South Korea, January 11, 2005.
- Invited Speaker, *Workshop on Measurement, Modeling and Analysis of the Internet*, Institute for Mathematics and its Applications (IMA), Minneapolis, MN, January 12, 2004.
- Keynote Speaker, *First Workshop on Performance of Computational Systems and Communication*, part of the XXII Congress of the Brazilian Computer Society, Florianopolis, Brazil, July 18, 2002.
- Invited Speaker, Institute for Pure and Applied Mathematics (IPAM) Program on Large Scale Communication Networks, Los Angeles, CA, March 18-22, 2002.
- Invited Speaker, *DIMACS Workshop on Internet and WWW Measurement, Mapping and Modeling*, New Brunswick, NJ, February 13-15, 2002.
- Invited Speaker, *Workshop on Job Scheduling Strategies for Parallel Processing*, Cambridge, MA, June 16, 2001.
- Invited Speaker, *COST 257 Final Conference*, Würzburg, Germany.
- Invited Plenary Speaker, *Performance Tools 2000: The 11th International Conference on Modelling Techniques and Tools for Computer Performance Evaluation*, Schaumburg, Illinois, March 27 - 31, 2000.
- Invited Speaker, *Institute for Mathematics and Its Applications Workshop: "Scaling Phenomena in Communication Networks,"* Minneapolis, MN, October 22-24, 1999.
- Invited Speaker, Boston University Minority Engineers' Society, 2nd Annual Technical Exposition, Boston, MA, April 10, 1999.
- Invited Speaker, Workshop on Intelligent Internet Infrastructure, IBM T.J. Watson Laboratory, Yorktown Heights, NY, March 22, 1999.
- Invited Speaker, Workshop on Architectures, Performance, and Applications in Globally Distributed Web Services, Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil, March 11 - 12, 1998.
- Invited Speaker, Long-Range Dependence and Self-Similar Network Traffic Session, Winter Simulation Conference, Atlanta, GA, Dec. 7-10, 1997
- Invited Speaker, DIMACS/NSF Workshop on "End-to-End Network Modeling and Simulations," Princeton University, Princeton, NJ, October 23-25, 1997.
- Invited Panelist, Hot Topic Session On Traffic Characterization, ITC-15, Washington DC, June 22-27, 1997
- Invited Speaker, IFIP Working Group 7.3 Workshop, June 19-20, Orcas Island, WA.
- Invited Panelist, "Engineering Implications of Long-Range Dependence in Teletraffic Data," MASCOTS '97, January 1997, Haifa, Israel
- Invited Speaker, Applied Probability Session of Informs, the Operations Research Society, May 1997, San Diego, CA.
- Invited Speaker, Joint Research Conference on Statistics in Quality, Industry and Technology, May 29-31 1996, NIST, Gaithersburg, MD. Sponsored by the *American Statistical Association*, the *Institute of Mathematical Statistics*, E. I. du Pont, and the *National Institute of Standards and Technology*.

**PROFESSIONAL ACTIVITIES**

- Scientific Advisory Board of the Max Plank Institute for Software Systems, 2016 – present.
- Member, IETF/IRTF Applied Networking Research Prize Selection Committee, 2014-present.
- Executive Steering Committee of the Hariri Institute for Computing and Computational Science & Engineering, 2011 - 2014.
- Member of the External Review Visiting Committee for the Department of Computer Science at Amherst College, February 2013.
- Organized Workshop: “GPU Programming with CUDA” at Boston University, July 24, 2012.
- Member, SIGCOMM Rising Star Award Selection Committee, 2011.
- Chair, SIGCOMM Test of Time Award Selection Committee, 2011.
- Team Mentor for Conrad Awards, Cyber Security Challenge 2011.
- External Judge for FCC’s Open Internet Apps Challenge, 2011.
- General Co-Chair, CoNEXT 2011.
- Internet2 perfSONAR Workshop, Executive Committee, 2010.
- Chair, ACM SIGCOMM 2007–2009.
- Program Co-Chair, IFIP Networking 2010.
- Internet2 Network Research Strategic Planning Team, 2009-present.
- Internet2 Network Research Review Committee, <http://www.internet2.edu/networkresearch/nrrc.html>, 2009-present.
- Advisory Board of CRAWDAD (Community Resource for Archiving Wireless Data At Dartmouth).
- Steering Committee, Passive and Active Measurement Workshop (PAM), 2004-2006.
- General Chair, Passive and Active Measurement Workshop (PAM) 2005.
- Steering Committee, Internet Measurement Conference, 2003-2007.
- ACM SIGCOMM Executive Committee, Award Committee Chair, 2003-2006.
- Program Committee Chair, Internet Measurement Conference 2003.
- Co-organizer (with C. Lindemann and M. Reiser), Workshop on Internet Performance Modeling, Dagstuhl Castle, Germany, September 26-29, 1999.
- Co-organizer (with five others), BU/NSF Workshop on Internet Measurement, Instrumentation, and Characterization; Boston University, August 30, 1999.
- Tutorials Chair, SIGMETRICS ’99, Atlanta GA.
- Program Committees:
- SIGCOMM: 2002, 2006, 2008, 2012, 2017
  - SIGMETRICS: 1999, 2000, 2002, 2007, 2009, 2010, 2011, 2012, 2014, 2015, 2016
  - CoNEXT: 2005, 2007, 2010, 2011
  - Internet Measurement Conference: 2002, 2004, 2007, 2010, 2012, 2015, 2017, 2018
  - ICDM: 2018
  - WWW Conference: 2000, 2001, 2002, 2019 (become The Web Conference)
  - KDD: 2017
  - Intelligent Systems for Molecular Biology (ISMB): 2015, 2017
  - First IMC Workshop on Internet Visualization: 2012
  - Performance: 2011
  - Passive and Active Measurement Workshop (PAM): 2009, 2010
  - Infocom: 2009 (TPC Area Chair), 2010 (TPC Area Chair)

- IFIP Networking: 2009
- NetEval: 2009
- HotMetrics: 2008
- E2EMON: 2007
- First Workshop on Experimental Computer Science: 2007
- Workshop on Mining Network Data (MineNet-06): 2006
- Workshop on Large Scale Network Inference: 2005
- 6th Global Internet Symposium: 2001
- 6th International Workshop on Web Caching and Content Distribution: 2001
- Workshop on Caching, Coherence and Consistency: 2001
- Workshop on Network-Related Data Management: 2001
- ITC Specialist Seminar on IP Traffic Management and Modeling: 2000
- SPIE Performance and Control of Network Systems Conference: 1998, 1999
- 18th International Conference on Distributed Computing Systems (ICDCS-98): 1998
- Third IEEE Workshop on Services in Distributed and Networked Environments (SDNE '96): 1996

#### TUTORIALS AND SHORT COURSES

“Data Mining for Measurement Data,” presented at the 5th PhD School on Traffic Monitoring and Analysis, associated with the 7th International Workshop on Traffic Monitoring and Analysis, Barcelona, April 21-22, 2015. Available at <https://github.com/mcrovella/mining-low-dim-network-data>.

“Traffic Modeling: Methods and Results for Single Links and Whole Networks,” presented at SIGCOMM 2004, Portland OR.

“Traffic Modeling,” short course presented at Aalborg University, February 2, 2004.

“Performance Characteristics of World Wide Web Information Systems,” presented at SIGMETRICS '97, Seattle WA, June 1997; SIGMETRICS '98, Madison WI, June 1998; and Performance Tools '98, Palma de Mallorca, Spain, September 1998.

#### CONSULTING

**Member of the Technical Advisory Board**, Guavus, Inc. 2006 to 2017.

**Consultant**, Fujitsu Laboratories of America, Sunnyvale, CA. 2002 to 2004.

**Consultant and Expert Witness**, in litigation cases involving software patents, software trade secrets, and intellectual property. Ongoing.

**Member of the Technical Advisory Board**, epicRealm, Inc., Richardson, TX. March 2000 to May 2001.

**Consultant and Member of the Technical Advisory Board**, WebManage Technologies, Inc., Chelmsford MA. July 1999 to November 2000.

**Founder and Principal Technical Officer**, Commonwealth Network Technologies, Inc., Boston MA. Incorporated April 27, 1998; acquired by WebManage Technologies, October 12, 1999.

**Consultant and Member of the Technical Advisory Board**, VitalSigns Software Inc., Santa Clara, CA; acquired by International Network Services, Inc.; now part of Lucent. November 1996 to October 1999.

## PATENTS

- Method and Apparatus for Whole-Network Anomaly Diagnosis and Method to Detect and Classify Network Anomalies Using Traffic Feature Distributions*, US Patent # 8,869,276, issued October 21, 2014.
- Compressed Set Representation for Sets as Measures in OLAP Cubes*, US Patent # 8,533,167, issued September 10, 2013.
- Method and Apparatus for Dynamic Resource Discovery and Information Distribution in a Data Network*, US Patent # 7,747,741, issued June 29, 2010.
- System for Creating and Distributing Prioritized List of Computer Nodes Selected as Participants in a Distribution Job*, US Patent # 7,346,682, issued March 18, 2008.
- Method and Apparatus for Election of Group Leaders in a Distributed Network*, US Patent # 6,993,587, issued January 31, 2006.
- Method and Apparatus for Scalable Distribution of Information in a Distributed Network*, US Patent # 6,748,447, issued June 8, 2004.
- Method and Apparatus for Reliable and Scalable Distribution of Data Files in Distributed Networks*, US Patent # 6,718,361, issued April 6, 2004. European Patent # EP1305924 issued March 31, 2010.
- Distributed Routing*, US Patent # 6,370,584, issued April 9, 2002.
- Method and Apparatus for Assigning Tasks in a Distributed Server System*, US Patent # 6,223,205, issued April 24, 2001.

## DOCTORAL STUDENTS

- Giovanni Comarela**, Ph.D. July 2017. “On the Dynamics of Interdomain Routing in the Internet.”
- Natali Ruchansky**, Ph.D. August 2016. “Matrix Completion with Structure.” Co-advised with Evimaria Terzi.
- Andrej Cvetkovski**, Ph.D. May 2013. “Graph Embeddings for Low-Stretch Greedy Routing.”
- Gonca Gürsun**, Ph.D. March 2013. “Inferring Hidden Features in the Internet.”
- Vijay Erramilli**, Ph.D. December 2008. “Forwarding in Mobile Opportunistic Networks.”
- Nahur Fonseca**, Ph.D. December 2008. “Stochastic Modeling Applied to Detection Problems in Network Protocols and Traffic.”
- Anukool Lakhina**, Ph.D. August 2006. “Network-Wide Traffic Analysis: Methods and Applications.”
- Jun Liu**, Ph.D. August 2002. “Characterizing Network Elements and Paths Using Packet Loss Behavior.”
- Paul Barford**, Ph.D. June 2000. “Modeling, Measurement and Performance of World Wide Web Transactions.”
- Robert L. Carter**, Ph.D. January 1998. “Performance Measurement and Prediction in Packet-Switched Networks: Techniques and Applications.”

## OTHER DOCTORAL STUDENTS ADVISED

- Mengfei Cao**, Ph.D, August 2016, “New Graph Metrics Improve Network-based Protein Function Prediction” Tufts University, Member of the Committee.
- Bimal Viswanath**, Ph.D, April 2016, “Towards Trustworthy Social Computing Systems.” Universität des Saarlandes, Member of the Committee.
- Yonjun Liao**, Ph.D., January 2013, “Learning to Predict End-to-End Network Performance.” Université de Liège, Belgium, Member of the Jury.
- Diana Zeaiter Joumlatt**, Ph.D., December 2012, “Prediction of User Dissatisfaction with Internet Application Performance at End-Hosts.” Université Pierre et Marie Curie, Rapporteur.

- Chrisil Arackaparambil**, Ph.D., July 2011, “Anomaly Detection in Network Streams Through a Distributional Lens.” Dartmouth College, Member of the Examining Committee.
- Italo Cunha**, Ph.D., July 2011, “Tracking Internet Routes and Path Reachability for Network Tomography.” Université Pierre et Marie Curie (U. Paris VI), Rapporteur.
- Hung Nguyen**, Ph.D., February 2008, “User-level Internet Tomography and Overlay Routing.” Ecole Polytechnique Fédérale de Lausanne (EPFL), Rapporteur.
- Benoit Donnet**, Ph.D., September 2006, “Algorithms for Large-Scale Topology Discovery.” Université Pierre et Marie Curie (U. Paris VI), Président du Jury.
- David Chua**, Ph.D. (Mathematics), May 2006, “Statistical Analysis for Whole Networks.” Second Reader.
- Stilian Stoev**, Ph.D. (Mathematics) May 2005.
- Abhishek Kumar**, Ph.D., October 2005, “Network Data Streaming: Algorithms for Network Monitoring and Coordination.” Georgia Tech, Committee Member.
- Marjan Bozinovski**, Ph.D., May 2004, “Fault-Tolerant Platforms for IP-Based Session Control Systems.” Aalborg University, Committee Member.
- Artur Ziviani**, Ph.D. December 2003, “Qualité de Service et Localisation d’Hotes.” University of Paris VI, Examineur.
- Liang Guo**, Ph.D. April 2003, “Size-Aware Scheduling of TCP Flows.” Second Reader.
- Alberto Medina**, Ph.D. March 2003, “Practical Estimation of Internet Traffic Demands.” Third Reader.
- Vladas Pipiras**, Ph.D. (Mathematics) April 2002, “Symmetric Stable Self-Similar Processes.” Third Reader.
- Khaled A. Harfoush**, Ph.D. November 2001, “A Framework for End-to-End Characterization of Metric-Induced Network Topologies.” Committee Member.
- Santiago M. Pericas-Geertsen**, Ph.D. November 2001, “XML-Fluent Mobile Agents.” Committee Member.
- Alia K. Atlas**, Ph.D. August 1998, “Statistical Rate Monotonic Scheduling.” Second Reader.
- Ghulam Bhatti**, Ph.D. January 1998, “Parallel and Distributed Discrete Event Simulation: An Event-Reservation Approach.” Second Reader.
- Sulaiman Mirdad**, Ph.D. June 1997, “WebWave: Globally Load-Balanced, Fully-Distributed Caching”. Second Reader.
- Gi Tae Kim**, Ph.D. June 1997, “Framework for Adaptive Forward Erasure Recovery (AFER) for Fault-Tolerant Real-Time Communications”. Second Reader.
- Carlos Cunha**, Ph.D. June 1997, “Trace Analysis and its Application to Performance Enhancements of Distributed Information Systems”. Second Reader.
- Susan Nagy**, Ph.D. April 1997, “Admission Control and Scheduling Strategies for Real-Time Database Systems”. Second Reader.
- Vadim Teverovksy**, Ph.D. February 1997 (Mathematics), “Detection and Estimation of Long-Range Dependence.” Third Reader.
- Euthimios Panagos**, Ph.D. May 1995, “Client-Based Logging: A New Paradigm for Distributed Transaction Management”. Third Reader.

#### MASTERS STUDENTS

- Megan Hacker**, M.S. May 2012, “Methods for Pairing Mobile Devices Through Shared Sensing”
- Lauren Walters**, MSc. May 2004, “A Web Browsing Workload Model for Simulation,” University of Cape Town, South Africa, external examiner.
- Alan Charbonneau**, M.A. May 2003, “Simulation of an SJF Proxy”
- Iana Vitkova**, M.A. May 2003, “Simulation of an SJF Proxy”



- Robert Frangioso**, M.A. Sept 2002, "Connection Scheduling in Web Servers"
- Xiaohui Zhang**, M.S. May 1999, "Cachability of Web Objects"
- Scott Harrison**, M.S. May 1998, "DPR Monitor: A Web-based DPR Network Monitoring Tool"
- Stanley Gambarin**, M.S. May 1997, "Implementing a Single-Process Non-Multithreaded World Wide Web Server"
- Kostas Magoutis**, M.S. May 1996, "Economies of Scale In Partitioned Disk Caches with Self-Similar References"
- Fred Bierhaus**, M.S. May 1996, "Improving Interactive Traffic Through the EQL Driver"

#### BOOKS

- M. Crovella and B. Krishnamurthy, "Internet Measurement: Infrastructure, Traffic, and Applications," John Wiley and Sons, 2006, 512 pp.

#### BOOKS EDITED

- M. Crovella and L. M. Feeney and D. Rubenstein (editors), "Proceedings of the 9th International IFIP TC 6 Networking Conference," Springer-Verlag, 410pp, 2010.

#### JOURNAL ARTICLES

- D. Lancour, A. Naj, R. Mayeux, J. L. Haines, M. A. Pericak-Vance, G. C. Schellenberg, M. Crovella, L. A. Farrer, and S. Kasif, "One for All and All for One: Improving Replication of Genetic Studies through Network Diffusion," *PLoS Genetics*, Vol 14, April 2018.
- A. Cvetkovski and M. Crovella, "Low-stress Data Embedding in the Hyperbolic Plane Using Multidimensional Scaling," *Applied Mathematics and Information Sciences*, Vol 11, Number 1, January 2017.
- A. Cvetkovski and M. Crovella, "Multidimensional Scaling in the Poincare Disk," *Applied Mathematics and Information Sciences*, Vol 10, Number 1, January 2016.
- M. Cao, H. Zhang, J. Park, N. Daniels, M. Crovella, L. Cowen, and B. Hescott, "Going the Distance for Protein Function Prediction: A New Distance Metric for Protein Interaction Networks," *PLoS One*, Vol 8, Number 10, October 2013.
- A. Cvetkovski and M. Crovella, "On the Choice of a Spanning Tree for Greedy Embedding of Network Graphs," *Networking Science*, February 2013.
- B. Donnet, P. Raoult, T. Friedman, and M. Crovella, "Deployment of an Algorithm for Large-Scale Topology Discovery," *IEEE Journal on Selected Areas in Communications, Special Issue on Sampling the Internet*, Vol 24, Number 12, December 2006.
- D. Chua, E. Kolaczyk, and M. Crovella, "Network Kriging," *IEEE Journal on Selected Areas in Communications, Special Issue on Sampling the Internet*, 2006.
- B. Gueye, A. Ziviani, M. Crovella, and S. Fdida, "Constraint-Based Geolocation of Internet Hosts," *IEEE/ACM Transactions on Networking*, Vol 14, Number 6, December 2006.
- R. Fonseca, V. Almeida, and M. E. Crovella, "Locality in a Web of Streams," *Communications of the ACM*, 48(1), pp. 82–88, January 2005.
- M. Fayed, P. Krapivsky, J. Byers, M. Crovella, D. Finkel, and S. Redner, "On the Emergence of Highly Variable Distributions in the Autonomous System Topology," *Computer Communication Review*, 33(2), pp. 41–49, July 2003.
- A. Lakhina, J. W. Byers, M. E. Crovella, and I. Matta, "On the Geographic Location of Internet Resources," *IEEE Journal on Selected Areas in Communications, Special Issue on Internet and WWW Measurement, Mapping, and Modeling*, 2003.

- P. Barford and M. E. Crovella, "Critical Path Analysis of TCP Transactions," *IEEE/ACM Transactions on Networking*, 9 (3), pp. 238–248.
- M. E. Crovella, C. Lindemann, and M. Reiser, "Internet Performance Modeling: the state of the art at the turn of the century," *Performance Evaluation*, 42 (2–3), pp. 91–108, September 2000.
- R. L. Carter and M. E. Crovella, "On the Network Impact of Dynamic Server Selection," *Computer Networks*, 31 (23–24), pp. 2529–2558.
- M. Harchol-Balter, M. E. Crovella and C. D. Murta, "On Choosing a Task Assignment Policy for a Distributed Server System," *Journal of Parallel and Distributed Computing*, Special Issue on Software Support for Distributed Computing, September 1999.
- P. Barford and M. E. Crovella, "Measuring Web Performance in the Wide Area," *Performance Evaluation Review*, Special Issue on Network Traffic Measurement and Workload Characterization, August 1999.
- P. Barford, A. Bestavros, A. Bradley, and M. E. Crovella, "Changes in Web Client Access Patterns: Characteristics and Caching Implications," *World Wide Web*, Special Issue on World Wide Web Characterization and Performance Evaluation, 1999.
- M. E. Crovella and M. S. Taqqu, "Estimating the Heavy Tail Index from Scaling Properties," *Methodology and Computing In Applied Probability*, 1(1), 1999.
- M. E. Crovella and A. Bestavros, "Self-Similarity in World Wide Web Traffic: Evidence and Possible Causes," *IEEE/ACM Transactions on Networking*, 5(6):835–846, December 1997.
- R. L. Carter and M. E. Crovella, "Measuring Bottleneck Link Speed in Packet-Switched Networks," *Performance Evaluation*, 27&28:297–318, October 1996.
- L. A. Cowl, M. E. Crovella, T. J. LeBlanc, and M. L. Scott, "The Advantages of Multiple Parallelizations in Combinatorial Search," *Journal of Parallel and Distributed Computing*, special issue on Data-Parallel Algorithms and Programming, 21(1):110–123, April 1994.

#### BOOK CHAPTERS

- M. E. Crovella, M. S. Taqqu, and A. Bestavros, "Heavy-Tailed Probability Distributions in the World Wide Web," Chapter 1 of *A Practical Guide To Heavy Tails*, pages 3–25, Chapman & Hall, New York, 1998.
- M. E. Crovella and L. Lipsky, "Simulations with Heavy-Tailed Workloads," Chapter 3 of *Self-Similar Network Traffic and Performance Evaluation*, Wiley/Wiley-Interscience, 1999.
- K. Park, G. Kim and M. Crovella, "The Protocol Stack and its Modulation Effect on Self-Similar Traffic," Chapter 16 of *Self-Similar Network Traffic and Performance Evaluation*, Wiley/Wiley-Interscience, 1999.
- M. E. Crovella, "Performance Characteristics of the World Wide Web," in *White Book on Performance Evaluation*, Günter Haring, Christoph Lindemann, and Martin Reiser, editors, Springer-Verlag, 1999.

#### INVITED PAPERS

- M. E. Crovella, "Performance Evaluation with Heavy Tailed Distributions," in *Lecture Notes in Computer Science 1786*, Proceedings of the 11th International Conference on Modelling Tools and Techniques for Computer and Communication System Performance Evaluation (TOOLS '2000), pp. 1–9, March 2000. Revised version appeared in *Job Scheduling Strategies for Parallel Processing : 7th International Workshop*, pp. 1–10, June 16, 2001.

## REFEREED CONFERENCE PAPERS

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##### "The Statistics of Human Activity and Implications for Security"

- BU Statistics Club, Professor Speaker Series, November 10, 2016.

##### "Analyzing the Evolution of Internet Routing through Path Analysis"

- Cisco FAST Seminar Series, July 17, 2015.
- Raytheon BBN Technologies, SDP Seminar, September 28, 2015.

##### "Reversing the Curse of Dimensionality for Security Analysis"

- NYU Poly Department of Computer Science, December 5, 2014.

##### "Anomaly Detection and Dimensionality Reduction"

- Workshop on Mathematics of Data Analysis in Cybersecurity, ICERM, Brown University, October 24, 2014.

##### "Targeted Matrix Completion"

- 51st Annual Allerton Conference on Communication, Control, and Computing, University of Illinois at Urbana-Champaign, October 3, 2013.

##### "Better Routing with Hyperbolic Geometry"

- Laboratory of Information, Networking and Communication Sciences (LINCS) Paris, December 19, 2012.

##### "A Fine Grained Distance Metric for Small Worlds"

- Université de Liège, Liège Belgium, January 11, 2013.
- Laboratory of Information, Networking and Communication Sciences (LINCS) Paris, Mar 20, 2012.

##### "Inferring Invisible Traffic"

- Williams College, Dept. of Computer Science, Williamstown, MA, November 22, 2013.
- Tufts University, Dept. of Computer Science, Medford, MA, November 7, 2013.
- University of Miami, Dept. of Computer Science, Miami, FL, March 2, 2011.
- International Computer Science Institute (ICSI), Berkeley, CA, July 20, 2010.
- Statistics of Networks Workshop, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, June 24, 2010.

“Network Monitoring: Challenges and Opportunities”

- Indian Institute of Technology (IIT), Delhi, India, June 9, 2008.

“Exploiting Feature Distributions in Anomaly Diagnosis”

- Dartmouth, November 28, 2005.
- MIT CSAIL-LIDS Networking and Systems Seminar, Cambridge MA, April 11, 2005.

“Network Anomaly Diagnosis”

- Boston Area Networking and Networkers Annual Summit (BANANAS-2005), BBN Technologies, Cambridge MA, January 20, 2005.

“Applying the Subspace Method to Network Traffic Analysis”

- Statistical Research Center for Complex Systems (SRCCS), Workshop on “Internet Measurement, Modeling, and Analysis,” Seoul National University, Seoul, South Korea, January 11, 2005.
- Electronics and Telecommunications Research Institute (ETRI), Daejeon, South Korea, January 13, 2005.

“Diagnosing Network-Wide Traffic Anomalies”

- Columbia University, Nov. 17, 2004.
- Workshop on Internet Signal Processing (WISP), CAIDA, Nov. 11, 2004.
- Ecole Normale Supérieure, Paris, Apr. 13, 2004.
- France Telecom R&D, Paris, Mar. 18, 2004.

“Structural Analysis of Network Traffic Flows”

- Project Metropolis Meeting, École Nationale Supérieure des Télécommunications de Bretagne (ENST), Rennes, Feb. 10, 2004.
- Institute for Mathematics and its Applications, Workshop on “Measurement, Modeling and Analysis of the Internet,” Minneapolis, MN, January 12, 2004.

“Virtual Landmarks for the Internet”

- Intel Research, Cambridge UK, October 1, 2003.
- Ecole Polytechnique Fédérale de Lausanne (EPFL), November 10, 2003.
- Laboratoire d’Informatique de Paris VI (LIP6), November 14, 2003.

“Sampling Biases in IP Topology Measurements”

- Séminaire Graphes, Réseaux et Modélisation, Laboratoire de Recherche en Informatique, Université d’Orsay, January 8, 2004.
- IBM T.J. Watson Labs, April 11, 2003.
- BU Statistics Colloquium, April 10, 2003.
- National Institute of Statistical Sciences, March 28, 2003.