

Dr. Robert Beverly

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EDUCATION

- Massachusetts Institute of Technology** Cambridge, MA
Ph.D in Electrical Engineering and Computer Science, June 2008.
- Massachusetts Institute of Technology** Cambridge, MA
MS in Electrical Engineering and Computer Science, September 2004.
- Georgia Institute of Technology** Atlanta, GA
BS in Computer Engineering, December 1996. *Magna Cum Laude*.

RESEARCH INTERESTS

Broad interest in networks, systems engineering, and Internet measurement. The practical application of machine learning and data mining to real-world Internet problems including routing, provisioning, service selection, and security.

PROFESSIONAL EXPERIENCE

- Naval Postgraduate School** Sep. 2009 – Present
Assistant Professor Monterey, CA
Conduct fundamental and applied research with a concentration on network architecture, security, and the science of complex systems. Teach and advise graduate students.
- BBN Technologies** Jul. 2008 – Sep. 2009
Network Scientist Cambridge, MA
Contributed to the development of a next-generation disruption and delay tolerant network (DTN) platform, including intelligent content routing in challenged contexts. Developed and standardized a DTN-specific service discovery mechanism. Implemented a time-dilation method for emulating large networks in a virtual machine environment including modeling of the wireless channel.
- Massachusetts Institute of Technology** Sep. 2002 – Jun. 2008
Research Assistant Cambridge, MA
Conduct research on core design principles and network technology in the Advanced Network Architecture group. Developed and lead large-scale Internet neutrality, IP spoofer and electronic mail measurement initiatives that were published, used by regulatory bodies and covered by media. Dissertation research provides architectural guidelines for the practical application of statistical learning to network problems such as service selection, routing and security.
- MCI, Advanced Internet Technology** Jul. 1998 – Jul. 2002
Senior Engineer Ashburn, VA
Responsible for the measurement infrastructure of several large, international, mission-critical networks including UUNET IP and MCI Frame Relay. Used flow data from custom-developed high-speed passive optical monitors to analyze traffic for peering decisions and traffic engineering. Engineered and supported the NSF sponsored vBNS R&E backbone. Led evaluation, testing and deployment of next generation gigabit routers in MCI's network. Developed a multicast performance test suite and played a key role in MCI's content distribution and video strategy.

REFEREED PUBLICATIONS

1. G. Kakavelakis, R. Beverly, and J. Young. Auto-learning of SMTP TCP Transport-Layer Features for Spam and Abusive Message Detection. In *Proceedings of the 25th USENIX Large Installation Systems Administration Conference (LISA)*, Dec. 2011
2. S. Bauer, R. Beverly, and A. Berger. Measuring the state of ecn readiness in servers, clients, and routers. In *Proceedings of the ACM 11th annual conference on Internet measurement, IMC '11*, 2011
3. S. Huchton, G. G. Xie, and R. Beverly. Building and evaluating a k-resilient mobile distributed file system resistant to device compromise. In *Military Communications Conference - MILCOM 2011*, Nov. 2011
4. R. Beverly, S. Garfinkel, and G. Cardwell. Forensic carving of network packets and associated data structures. *Digital Investigation*, 8(Supplement 1):S78 – S89, 2011. The Proceedings of the Eleventh Annual DFRWS Conference, 11th Annual Digital Forensics Research Conference
5. Z. N. J. Peterson, M. Gondree, and R. Beverly. A position paper on data sovereignty: The importance of geolocating data in the cloud. In *Proceedings of the 3rd USENIX workshop on Hot Topics in Cloud Computing*, June 2011
6. R. Beverly, A. Berger, and G. G. Xie. Primitives for active internet topology mapping: toward high-frequency characterization. In *Proceedings of the ACM 10th annual conference on Internet measurement, IMC '10*, pages 165–171, 2010
7. R. Jansen and R. Beverly. Toward anonymity in delay tolerant networks: Threshold pivot scheme. In *Military Communications Conference - MILCOM 2010*, pages 587–592, Nov. 2010
8. R. Beverly, A. Berger, Y. Hyun, and k. claffy. Understanding the efficacy of deployed internet source address validation filtering. In *Proceedings of the 9th ACM SIGCOMM conference on Internet measurement conference, IMC '09*, pages 356–369, 2009
9. R. Beverly. A human factors approach to spam filtering. In *Proceedings of the Sixth Conference on Email and Anti-Spam (CEAS)*, July 2009
10. R. Beverly and K. Sollins. An internet protocol address clustering algorithm. In *Proceedings of the USENIX Third conference on Tackling computer systems problems with machine learning techniques, SysML'08*, pages 5–5, 2008
11. R. Beverly and K. Sollins. Exploiting transport-level characteristics of spam. In *Proceedings of the Fifth Conference on Email and Anti-Spam (CEAS)*, Aug. 2008
12. R. Beverly, S. Bauer, and A. Berger. The internet is not a big truck: toward quantifying network neutrality. In *Proceedings of the 8th international conference on Passive and active network measurement, PAM'07*, pages 135–144, Berlin, Heidelberg, 2007. Springer-Verlag
13. R. Beverly and M. Afegan. Machine learning for efficient neighbor selection in unstructured p2p networks. In *Proceedings of the 2nd USENIX workshop on Tackling computer systems problems with machine learning techniques*, pages 1:1–1:6, 2007
14. R. Beverly, K. Sollins, and A. Berger. Svm learning of ip address structure for latency prediction. In *Proceedings of the 2006 SIGCOMM workshop on Mining network data, MineNet '06*, pages 299–304, 2006
15. S. Bauer, P. Faratin, and R. Beverly. Assessing the assumptions underlying mechanism design for the internet. In *Economics of Networked Systems*, June 2006
16. R. Beverly and S. Bauer. The spoofer project: inferring the extent of source address filtering on the internet. In *Proceedings of the USENIX Steps to Reducing Unwanted Traffic on the Internet on Steps to Reducing Unwanted Traffic on the Internet Workshop*, pages 8–8, 2005
17. M. Afegan and R. Beverly. The state of the email address. *SIGCOMM Comput. Commun. Rev.*, 35:29–36, January 2005

18. R. Beverly. A robust classifier for passive tcp/ip fingerprinting. In C. Barakat and I. Pratt, editors, *Passive and Active Network Measurement*, volume 3015 of *Lecture Notes in Computer Science*, pages 158–167. Springer Berlin / Heidelberg, 2004
19. R. Beverly. RTG: A Scalable SNMP Statistics Architecture for Service Providers. In *Proceedings of the 16th USENIX Large Installation Systems Administration Conference (LISA)*, pages 167–174, Nov. 2002

OTHER PUBLICATIONS

1. k. claffy, E. Aben, J. Auge, R. Beverly, F. Bustamante, B. Donnet, T. Friedman, M. Fomenkov, P. Haga, M. Luckie, and Y. Shavitt. The 2nd workshop on active internet measurements (aims-2) report. *ACM SIGCOMM Comput. Commun. Rev.*, 40:53–58, 2010
2. k. claffy, M. Fomenkov, E. Katz-Bassett, R. Beverly, B. A. Cox, and M. Luckie. The workshop on active internet measurements (aims) report. *SIGCOMM Comput. Commun. Rev.*, 39:32–36, October 2009
3. R. Beverly. Robust clustering techniques in bioinformatics (18.417), Dec. 2004. <http://ocw.mit.edu>
4. R. Beverly. MS-SQL slammer/sapphire traffic analysis, Jan. 2003. <http://ana.csail.mit.edu/slammer/>

PATENTS

1. “Remote Detection of Compromised and Malicious Network Hosts Through Traffic Stream Analysis,” US Patent (pending).
2. “Method for generating packet loss report by a data coordinator in a multicast data transmission,” US Patent 6,732,182. May 2000.

SELECTED TALKS

1. “Directed Probing for Efficient and Accurate Active Measurements,” CAIDA AIMS-2 Workshop, San Diego, CA, Feb 2010.
2. “Transport Characteristics of Spam,” End-to-End Meeting, Feb 2008.
3. “Machine Learning and Networks,” Panel Discussion, USENIX SysML, Apr 2007.
4. “The Spoofer Project,” NANOG 34, Seattle, WA, May 2005.
5. “RTG: A Scalable SNMP Architecture for Service Providers,” NANOG 27, Phoenix, AZ, Feb 2003.
6. “IP Streaming for Broadcast Engineers,” IEEE NAB, Las Vegas, NV, Apr 2002.
7. “vBNS Update,” UKERNA Networkshop 29, Exeter, England, Mar 2001.
8. “Multicast Performance Measurement on a High-Performance IP Backbone,” NANOG, Washington, DC, Oct 2000.

SERVICE

1. Technical Program Committee: ACM IMC 2010, IEEE NGNI 2010, CEAS 2009.
2. General Chair: ACM Hotnets 2010
3. Reviewer: IEEE Privacy and Security 2010, IEEE ToN 2010, SECON 2009, ACM TISSEC 2008, IEEE ToN 2008, USENIX SysML 2007, ACM CCR, IEEE TDSC 2006, IEEE TPDS 2006, IEEE Sarnoff 2007, MIT CSW 2005-2006.
4. Program review: NSF GENI 2008, NSF NLANR 2004.
5. Invited participant: CAIDA AIMS 2010, AIMS 2009, Google M-lab Workshop 2008, CAIDA DatCat 2007, CAIDA CONMI Workshop 2005
6. MIT Center for Bits and Atoms Internet 0 Project. Editor for IETF Internet Drafts gershenfeld-thtp-01 and gershenfeld-i0-00, 2006.

7. MIT Africa Internet Technology Initiative (AITI)

AWARDS

1. IEEE ComSoc Fred W. Ellersick Prize for Best Paper, 2011
2. DFRWS Best Paper, 2011
3. USENIX LISA Best Paper, 2002

FUNDING

1. Principal Investigator, “SDCI Sec: Transport-Layer Abusive Traffic Detection and Mitigation,” from National Science Foundation (NSF) 2011-2014
2. Co-Principal Investigator, “NeTS: Exploring the Evolution of IPv6: Topology, Performance, and Traffic,” from National Science Foundation (NSF) 2011-2014. Co-PI: K. Claffy (UCSD).
3. Principal Investigator, “Transport-Layer Abusive Traffic Detection and Mitigation,” from Cisco University Research Grant 2011