NEIL SPRING

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RESEARCH INTERESTS

I am interested in computer networks, with an emphasis on building open and robust networked systems.

EDUCATION

University of Washington

Ph.D., Computer Science and Engineering, Summer 2004 (expected).
Dissertation: Reverse-Engineering the Internet
Advisors: David Wetherall and Thomas Anderson

M.S., Computer Science and Engineering, 2000.
Title: A Protocol-Independent Technique for Eliminating Redundant Network Traffic
Advisor: David Wetherall

University of California, San Diego

B.S., Computer Engineering, December, 1997. Minor: Organic Chemistry.

AWARDS AND HONORS

Best Student Paper, USENIX Symposium on Internet Technologies and Systems, 2003.
Best Student Paper, ACM SIGCOMM, 2002.
Achievement Rewards for College Scientists, W. Hunter Simpson Fellow, 1998–2001.

TEACHING EXPERIENCE

Introduction to Computer Communication Networks (Undergraduate, CSE/EE 461)

Instructor — Autumn 1999, and Autumn 2000

I taught this majors-only course twice, first with another graduate student and then on my own with full responsibility from textbook selection to final grade assignment. Approximately 35 undergraduate majors in computer science, computer engineering, and electrical engineering took the course each quarter.

Course software developer — Winter 2001 — present

I led the development of Fishnet, a network emulator for use in the class as a course project. Students build a complete network stack, from "ping," to routing, naming, sliding-window transport, and applications. The capstone assignment is to build a walkie-talkie using Compaq iPAQs communicating over an 802.11 wireless network.

Teaching Assistant

Computer Communication Networks, Professor David Wetherall (Graduate, CSE561)	Spring 2002
Network Systems, Professor Thomas Anderson (Professional Master's Program, CSE588)	Spring 1999
Transaction Processing, Dr. Philip Bernstein (Professional Master's Program, CSE593)	Winter 1999

PROFESSIONAL EXPERIENCE

Research Assistant, University of Washington. (advisors: David Wetherall and Thomas Anderson)
September 1998 — present

- Designed and implemented Scriptroute, a flexible platform for distributed network measurement with anonymous but secure remote execution. Scriptroute allows tools that measure the performance of network links and paths to be executed remotely, providing hundreds of vantage points on the Internet. Scriptroute was one of the first applications to run persistently on PlanetLab; it has been used for research projects at several institutions.
- Built Rocketfuel, a system for efficiently measuring network topologies from diverse vantage points. Rocketfuel combines BGP and DNS information with new network mapping techniques to accurately and efficiently measure network topologies.
- Contributed to the development of the ECN-nonce congestion signaling protocol. The ECN-nonce protocol verifies that receivers do not conceal network congestion by making them "prove" that they received each packet.
- Developed an efficient system for link compression that eliminates repetition in non-cacheable Web transfers.
- Created a Linux kernel module to prioritize inbound interactive network traffic over long-running background transfers at the receiver without network support.

Intern, Compaq Systems Research Center (SRC) (advisor: Michael Burrows) Summer 2000

- Developed a system for automatically recognizing and disabling the interfaces of Ethernet switches where misconfigured end-systems have attached.

Programmer, UC San Diego. (advisor: Francine Berman) January — August 1998

- Modified a gene sequence library comparison application to use Grid computing resources efficiently.

Intern, San Diego Supercomputer Center, NSF Research Experience for Undergraduates Program. Summer 1996

- Assisted the development of software to monitor and predict network performance and processor availability.

Computer Resource Specialist, Science & Engineering Library, UC San Diego December 1995 — January 1997

- Built Database Advisor, a meta-search tool for on-line Library indexes.

SERVICE

University of Washington Department of Computer Science and Engineering
Graduate Admissions Committee, 2001
Volunteer Tutor, 2001–2003

JOURNAL PUBLICATIONS

Neil Spring, Ratul Mahajan, David Wetherall, and Thomas Anderson. Measuring ISP topologies with Rocketfuel. *IEEE/ACM Transactions on Networking*, February 2004. (Forwarded from ACM SIGCOMM).

Fran Berman, Rich Wolski, Henri Casanova, Walfredo Cirne, Holly Dail, Marcio Faerman, Silvia Figueira, Jim Hayes, Graziano Obertelli, Jennifer Schopf, Gary Shao, Shava Smallen, Neil Spring, Alan Su, and Dmitrii Zagorodnov. Adaptive computing on the Grid using AppLeS. *IEEE Transactions on Parallel and Distributed Systems*, volume 14(4):369–382, April 2003.

Rich Wolski, John Brevik, Chandra Krintz, Graziano Obertelli, Neil Spring, and Alan Su. Running EveryWare on the computational grid. *IEEE Transactions on Parallel and Distributed Systems*, volume 12(10):1066–1080, October 2001.

Rich Wolski, Neil Spring, and Jim Hayes. Predicting the CPU availability of time-shared UNIX systems. *Cluster Computing: The Journal of Networks, Software Tools and Applications*, volume 3(4):293–301, December 2000.

Rich Wolski, Neil Spring, and Jim Hayes. The network weather service: A distributed resource performance forecasting service for metacomputing. *Future Generation Computer Systems*, volume 15(5-6):757–768, 1999.

CONFERENCE PUBLICATIONS

Ratul Mahajan, Neil Spring, David Wetherall, and Thomas Anderson. User-level Internet path diagnosis. In *ACM Symposium on Operating Systems Principles (SOSP)*, pages 106–119, October 2003. (17% acceptance rate).

Neil Spring, Ratul Mahajan, and Thomas Anderson. Quantifying the causes of path inflation. In *ACM SIGCOMM*, pages 113–124, August 2003. (10% acceptance rate).

Neil Spring, David Wetherall, and Thomas Anderson. Scriptroute: A public Internet measurement facility. In *USENIX Symposium on Internet Technologies and Systems (USITS)*, pages 225–238, March 2003. Best Student Paper. (28% acceptance rate).

Neil Spring, Ratul Mahajan, and David Wetherall. Measuring ISP topologies with Rocketfuel. In *ACM SIGCOMM*, pages 133–146, August 2002. Best Student Paper. (8.3% acceptance rate).

David Ely, Neil Spring, David Wetherall, Stefan Savage, and Thomas Anderson. Robust congestion signaling. In *IEEE International Conference on Network Protocols (ICNP)*, pages 332–341, November 2001. (23% acceptance rate).

Neil Spring and David Wetherall. A protocol independent technique for eliminating redundant network traffic. In *ACM SIGCOMM*, pages 87–95, August 2000. (11% acceptance rate).

Neil Spring, Maureen Chesire, Mark Berryman, Vivek Sahasranaman, Thomas Anderson, and Brian Bershad. Receiver based management of low bandwidth access links. In *Proceedings of IEEE Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies (INFOCOM)*, volume 1, pages 245–254, March 2000. (26% acceptance rate).

Rich Wolski, John Brevik, Chandra Krintz, Graziano Obertelli, Neil Spring, and Alan Su. Running EveryWare on the computational grid. In *IEEE Supercomputing (SC'99)*, November 1999. (29% acceptance rate).

Rich Wolski, Neil Spring, and Jim Hayes. Predicting the CPU availability of time-shared UNIX systems. In *Proceedings of High Performance Distributed Computing Conference (HPDC)*, pages 105–112, August 1999.

Neil Spring and Rich Wolski. Application level scheduling of gene sequence comparison on metacomputers. In *Proceedings of the 12th ACM International Conference on Supercomputing (ICS)*, pages 141–148, July 1998.

Rich Wolski, Neil Spring, and Chris Peterson. Implementing a performance forecasting system for metacomputing: The network weather service. In *IEEE Supercomputing (SC'97)*, November 1997. (17% acceptance rate).

WORKSHOP PUBLICATIONS

Neil Spring, David Wetherall, and Thomas Anderson. Reverse-engineering the Internet. In *Second ACM Workshop on Hot Topics in Networks (HotNets-II)*, November 2003. (19% acceptance rate).

Ratul Mahajan, Neil Spring, David Wetherall, and Thomas Anderson. Inferring link weights using end-to-end measurements. In *ACM SIGCOMM Internet Measurement Workshop*, pages 231–236, November 2002. (42% acceptance rate).

UNREFEREED PUBLICATIONS

Neil Spring, David Wetherall, and David Ely. Robust ECN signaling with nonces. IETF RFC 3540, June 2003. http://www.ietf.org/rfc/rfc3540.txt.

INVITED TALKS

North American Network Operators' Group (NANOG 26), October, 2002
Presented *Scriptroute: A Public Internet Measurement Facility*.

Computer Communications Workshop (IEEE CCW), October, 2001
Presented *Robust Congestion Signaling*.

Internet Engineering Task Force (IETF), March and October, 2001
Presented an Internet-Draft: *Robust ECN Signaling with Nonces*.

REFERENCES

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