Joseph D. Touch, Ph.D.

An extended CV in PDF is available at: http:/www.isi.edu/touch/cv.pdf; this is available at cv-digest.pdf

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Education

PhD. Computer and Information Science, University of Pennsylvania, 1992.
Advisor: David J Farber, Title: *Mirage: A Model for Latency in Communication*.

M.S. Computer Science, Cornell University, 1987.

B.S. Biophysics and Computer Science, University of Scranton, 1985 (summa cum laude with Honors).

Experience

Design, development and deployment of large scale network-based software/hardware systems, with major impact on widely-deployed applications and operating systems. Experienced with Internet architecture and protocols, the IETF process, VPN issues, security performance and configuration issues, network mobility, routing, and DNS.

US Air Force (October 2006-present), on-loan

Senior Network Engineer, TSAT Space Segment

Transformational Communications Satellite (TSAT) Program Office advisor on network issues.

USC / Information Sciences Institute (June 1992-present)

Director, Postel Center (since 10/2000)

Coordinates visiting scholars, graduate scholarships, facilities, and funding for a lab and center for network research in service to the Internet community.

Project Leader (since 10/1995)

Leads teams to design/implement large-scale software/hardware Internet systems for public distribution.

Designed and implemented the architecture of large software systems, as well as focused solutions to fine-grained network configuration control, DDOS protection, learning-based performance tuning, and embedded personal Internet devices.

Designed and implemented hardware for a high-speed LAN network interface, components of an all-optical Internet router, and devices for high-performance Internet checksums.

Research Scientist (since 6/1992)

Develops Internet link, network, application, and operating systems concepts for virtual networking, latency reduction, and high-speed networking.

Active participant in Internet standards (IETF) since 1997; notably in link (PILC, INT, TRILL, SHIM6), network (IP, L3VPN), security (IPSEC, BTNS), and transport (TCPM, TSVWG, PMTUD) working groups.

Designed and documented extensions to core Internet protocols including IP, TCP, HTTP, IPsec, and MD5.

Research Associate Professor (CS Associate since 6/2002, EE since 6/2003, CS Assistant 2/1994-6/2002)

Advises Ph.D. and M.S. students, teaches graduate classes on networking and distibuted systems.

Developed the Summer Graduate Research Experience Program (SGREP) at ISI (1999-2004).

Innocal Venture Capital (11/2000-present)

Consultant. Assesses the technological feasibility of Internet, networking, and distributed systems ventures.

Lehrman Group Council of Technology Advisors (8/1999-present)

Consultant. Assesses the technological feasibility of Internet and networking ventures.

Bell Communications Research (Bellcore, now Telcordia) (6/1997-2/1988)

Consultant. Developed algorithms for flow control in multicast packet networks. Designed and implemented multistage packet switch simulation tools.

Technical Leadership and Management

PC-ATOMIC high-speed network interface card (DARPA, 1994-1995)

Led a 7-member (~4 FTE) team over one year to develop a VL-bus PC network interface card for a 640-Mbps LAN. Designed the functional decomposition, data and control flow to support host-based and on-board CPU control, as well as DMA. Designed and programmed a PLD to perform a gigabit-per-second IP checksum during DMA. Also oversaw driver development and performance evaluation. Replicas were sent to several universities to support DARPA-funded research. Resulted in code used in Cisco's IOS.

LSAM multicast web push system (Linux RPM, FreeBSD port) (DARPA, 1996-1999)

Led a 17-member (~5 FTE) team over three years to design and implement a self-configuring multicast web push system. Provided demos semi-annually, publicly released four versions of software (5,000 lines C) and a separate push-only system (2,000 lines Perl and C). Resulted in patches to the Apache web server.

Tethernet Internet subnet rental system (stand-alone turnkey router) (DARPA, 2001-2004)

Led a 3-member (~2 FTE) team to design and implement a commercial-grade Internet subnet rental system (4,300 lines of Perl). Deployed the system at over a dozen DARPA and NSF meetings, supported hundreds of demos there and at the DARPA DISCEX conference, and provided Internet support to IEEE, ACM, and IFIP conferences. System currently on-loan to several universities worldwide, as well as SPAWAR, DARPA, and DHS.

X-Bone overlay deployment system (Linux RPM, FreeBSD & Cisco ports) (DARPA & NSF, 1998-2006)

Led a 19-member (~4-6.5 FTE) team over eight years to design and implement an Internet overlay (VPN) deployment system. Developed 13 public software releases in 2000-2006 (15,000 lines Perl), the most recent supporting global testbed deployment and stand-alone installation. The software was successfully "Red Team" analyzed for security considerations by Sandia National Laborotories. The system pioneered virtual network extensions to the Internet and is used at a number of universities and labs, and provides the basis for the EU 6Net testbed. Also resulted in patches to FreeBSD, MacOS/X, and Linux.

Professional Activities

IEEE Communications Society: Infocom Standing Committee 2005-present, Infocom 2006 Program Chair

ACM SIGCOMM: Conference Coordinator 2003-2007, Conference Coordinator Emeritus 2007-present

IEEE Network Editorial Board 1997-present

Elsevier Journal of Computer and Systems Sciences Editorial Board 2007-present

Areas of Publication

Total patents: 2 received, 3 pending *Books/chapters:* 7

Total journal papers: 18 *Total conference papers:* 36 *Internet RFCs:* 7, 6 pending

*Patent*s: Optical code cycle MAC system, Internet subnet rental behind NATs, Optical 'booster' router

Books/Published Tutorials: IEEE Tutorials Now on Virtual and Overlay Networks (2005), Grid book chapter on Network Infrastructure (2003), co-authored text on High Speed Networking (2001)

Optical (1998-): optical burst router, optical IP router, optical TTL decrementer, MAC issues

Overlays (1998-): X-Bone Internet overlay architecture, DynaBone multilayer overlays for fault tolerance,

TCP/IP (1995-): TCP shared control performance, string-based IP forwarding, server performance

Internet security (1995-): MD5 speed, authetication-free security, IPsec/routing interactions, TCP spoofing

Web (1997-2002): HTTP performance, multicast web push,

High-speed nets (1992-1998): Fast host router design, protocol parallization, web/file push

Link layer (2005-): link impact on Internet design, satellite impact on Internet design, bridge aggregation

A full list of publications is available at http://www.isi.edu/touch/pubs