

Apu Kapadia: Curriculum Vitae

Research Interests

Anonymity and Privacy, Network and Systems Security, Usability in Security, Applied Cryptography

Current Position

Member of Technical Staff
Information Systems Technology Group
MIT Lincoln Laboratory

Education

Ph.D. in Computer Science, October 2005
University of Illinois at Urbana-Champaign
Advisor: Prof. Roy H. Campbell

M.S. in Computer Science, May 2001
University of Illinois at Urbana-Champaign
Advisor: Prof. Roy H. Campbell

B.S. in Computer Science with Honors, May 1998
University of Illinois at Urbana-Champaign

Awards and Recognition

Honorable Mention Award (Runner-up for Best Paper)
The Fifth International Conference on Pervasive Computing (PERVASIVE '07)

Institute of Security Technology Studies (ISTS) Post-Doctoral Research Fellowship
Dartmouth College, October 2005–June 2008

Department of Energy High-Performance Computer Science Fellowship
Four Year Research Fellowship, September 2001–August 2005

Travel Grant
ACM Conference on Computer and Communications Security (CCS), 2004

Outstanding Department Service Award
Department of Computer Science, University of Illinois at Urbana-Champaign. May 2003

Invited Paper, The Journal of Supercomputing
Annette C. Feng, Apu C. Kapadia, Wu-chun Feng, and Geneva G. Belford, "Packet Spacing: An Enabling Mechanism for Delivering Multimedia Content in Computational Grids," 23(1):51–66 (2002)

Outstanding Class Project (CS 497 RHK)
First Annual Illinois Computer Systems Symposium (iCSS), 2002

Dean's List
College of Engineering, University of Illinois at Urbana-Champaign

Work Status

U.S. Citizen

Academic Activities

Teaching Experience

Instructor, CS 38—*Security and Privacy* (undergraduate and graduate students) Fall 2007
Department of Computer Science, Dartmouth College

Guest Lecture, *Privacy: Anonymous Communication Systems*, CS 38—Security and Privacy May 2006
Department of Computer Science, Dartmouth College

Founder and facilitator of Security Reading Group Seminar Nov 2005–Present
Institute for Security Technology Studies (ISTS), Dartmouth College

Co-founder and co-facilitator of Security Reading Group Seminar Sep 2000–May 2005
Department of Computer Science, University of Illinois at Urbana-Champaign

Guest Lecture, *Middleware*, CS 423 — Operating Systems Design Apr 2005
Department of Computer Science, University of Illinois at Urbana-Champaign

K–12 Outreach

Co-Lead Instructor June 23–27, 2008
Make and Break Cryptographic Security Summer Camp for Grades 10–12
Department of Computer Science, Dartmouth College

Lead Instructor June 25–29, 2007
Cybersecurity Summer Camp for Grades 10–12
Department of Computer Science, Dartmouth College

Security and Programming Instructor July 10–28, 2006
Summer Robotics Camp
Camp I (Grades 6–8), Camp II (Grades 6–8), and Camp III (Grade 9)
Department of Computer Science, Dartmouth College

Advising

Peter C. Johnson (graduate student)
Dartmouth College

Patrick P. Tsang (graduate student)
Dartmouth College

Jeffrey Fielding (undergraduate student)
Dartmouth College

Undergraduate interns for Women in Science Project (WISP)
Katelin Bailey
Linden Vongsathorn
Casey Gardiner
Fabeah Adu-Oppong

Research Appointments

MIT Lincoln Laboratory

MEMBER OF TECHNICAL STAFF, Information Systems Technology Group Sep 2008–Present

Dartmouth College

RESEARCH ASSISTANT PROFESSOR, Department of Computer Science Jul 2008–Aug 2008

POST-DOCTORAL RESEARCH FELLOW, Institute for Security Technology Studies Oct 2005–Jun 2008
PKI/Trust Lab with Prof. Sean W. Smith, and
Center for Mobile Computing (CMC) with Prof. David Kotz

Microsoft Research India, Bangalore (MSRI)

VISITING RESEARCHER, Rigorous Software Engineering Group (RSE) Aug 2007
Policy languages for privacy

University of Illinois at Urbana-Champaign (UIUC)

DOE RESEARCH FELLOW Sep 2001–Aug 2005
Advisor: Prof. Roy H. Campbell
Anonymity, privacy, security aware routing, and policy protection

RESEARCH ASSISTANT, Systems Software Research Group Sep 1999–Aug 2001
Advisor: Prof. Roy H. Campbell
Secure interoperability using dynamic role translation

Los Alamos National Laboratory (LANL)

GRADUATE RESEARCH ASSISTANT, RADIANT Group May 2002–Aug 2002
Mentor: Prof. Wu-chun Feng
Proactive queue management schemes

GRADUATE RESEARCH ASSISTANT, RADIANT Group May 2000–Aug 2000
Mentor: Prof. Wu-chun Feng
Rate-based protocols for congestion control

National Center for Supercomputing Applications (NCSA)

RESEARCH ASSISTANT, Horizon Group Jun 1999–Aug 1999
Implemented a distributed version of the Horizon Browser using RMI

RESEARCH ASSISTANT, Hierarchical Data Format Group Sep 1998–May 1999
Performance evaluation of “chunking” for PO.DAAC’s (JPL, NASA) datasets

UNDERGRADUATE RESEARCH PROGRAMMER, Hierarchical Data Format Group Jan 1997–Jun 1997
Implemented a distributed version of the Java HDF Viewer using Java servlets

Industrial Appointments

Jet Propulsion Laboratory (NASA)

SUMMER HIRE, Physical Oceanography DAAC (PO.DAAC) Jul 1998–Aug 1998
Developed Java client and server code to serve satellite data

Vosaic

UNDERGRADUATE RESEARCH PROGRAMMER Aug 1997–May 1998
Reflector code for streaming multimedia between Reflectors and RTSP servers

Strategic Technology Resources

SUMMER INTERN Jun 1997–Aug 1997
Developed a large multithreaded client application for an ISP system

Publications

Refereed Journal Papers

Annette C. Feng, Apu C. Kapadia, Wu-chun Feng, and Geneva G. Belford, "Packet Spacing: An Enabling Mechanism for Delivering Multimedia Content in Computational Grids," *The Journal of Supercomputing*, 23(1):51–66 (2002), (*Invited paper*).

Refereed Conference and Workshop Papers

Katelin Bailey, Apu Kapadia, Linden Vongsathorn, and Sean W. Smith, "TwoKind Authentication: Protecting Private Information in Untrustworthy Environments," *Seventh ACM Workshop on Privacy in the Electronic Society (WPES '08)*, Alexandria, VA, October 27, 2008. (Accepted for publication)

Acceptance rate 36%.

Patrick P. Tsang, Man Ho Au, Apu Kapadia, and Sean W. Smith, "PEREA: Towards Practical TTP-Free Revocation in Anonymous Authentication," *The 15th ACM Conference on Computer and Communication Security (CCS '08)*, Alexandria, VA, October 27–31, 2008. (Accepted for publication)

Acceptance rate 18%.

Cory Cornelius, Apu Kapadia, David Kotz, Dan Peebles, Minh Shin and Nikos Triandopoulos, "AnonySense: Privacy-Aware People-Centric Sensing," In *Proceedings of The Sixth ACM/USENIX International Conference on Mobile Systems, Applications, and Services (MOBISYS '08)*, pp. 211–224, Breckenridge, Colorado, June 17–20, 2008.

Acceptance rate 18%.

Apu Kapadia, Nikos Triandopoulos, Cory Cornelius, Daniel Peebles, and David Kotz, "AnonySense: Opportunistic and Privacy-Preserving Context Collection," In *Proceedings of The Sixth International Conference on Pervasive Computing (PERVASIVE '08)*, pp. 280–297, Sydney, Australia, May 19–22, 2008.

Acceptance rate 15%.

Apu Kapadia and Nikos Triandopoulos, "Halo: High-Assurance Locate for Distributed Hash Tables," In *Proceedings of the 15th Annual Network and Distributed System Security Symposium (NDSS '08)*, pp. 61–79, San Diego, CA, February 10–13, 2008.

Acceptance rate 18%.

Patrick P. Tsang, Man Ho Au, Apu Kapadia, and Sean W. Smith, "Blacklistable Anonymous Credentials: Blocking Misbehaving Users without TTPs," In *Proceedings of the 14th ACM Conference on Computer and Communication Security (CCS '07)*, pp. 72–81, Alexandria, VA, Oct 29–Nov 2, 2007.

Acceptance rate 18%.

Peter C. Johnson, Apu Kapadia, Patrick P. Tsang, and Sean W. Smith, "Nymble: Anonymous IP-Address Blocking," In *Proceedings of The Seventh International Symposium on Privacy Enhancing Technologies (PET '07)*, pp. 113–133, Ottawa, Canada, June 20–22, 2007. Springer-Verlag, LNCS 4776.

Acceptance rate 20%.

Apu Kapadia, Prasad Naldurg, and Roy H. Campbell, "Distributed Enforcement of Unlinkability Policies: Looking Beyond the Chinese Wall," In *Proceedings of The Eighth IEEE Workshop on Policies for Distributed Systems and Networks (POLICY '07)*, pp. 141–150, Bologna, Italy, June 13–15, 2007.

Acceptance rate 45%.

Apu Kapadia, Tristan Henderson, Jeffrey Fielding, and David Kotz, "Virtual Walls: Protecting Digital Privacy in Pervasive Environments," In *Proceedings of The Fifth International Conference on Pervasive Computing (PERVASIVE '07)*, pp. 162–179, Toronto, Canada, May 13–16, 2007. Springer-Verlag, LNCS 4480.

Acceptance rate 16%.

Honorable Mention Award (Runner-up for Best Paper)

Apu Kapadia, Patrick P. Tsang and Sean W. Smith, "Attribute-Based Publishing with Hidden Credentials and Hidden Policies," In Proceedings of The Fourteenth Annual Network and Distributed System Security Symposium (**NDSS '07**), pp. 179–192, San Diego, CA, February 28–March 2, 2007.

Acceptance rate 15%.

Apu Kapadia, Geetanjali Sampemane, and Roy H. Campbell, "KNOW Why Your Access Was Denied: Regulating Feedback for Usable Security," In Proceedings of Eleventh ACM Conference on Computer and Communications Security (**CCS '04**), pp. 52–61, Washington DC, October 25-29, 2004.

Acceptance rate 14%.

Apu Kapadia, Prasad Naldurg, and Roy H. Campbell, "Routing with Confidence: Supporting Discretionary Routing Requirements in Policy Based Networks," In Proceedings of Fifth IEEE International Workshop on Policies for Distributed Systems and Networks (**POLICY '04**), pp. 45–54, Yorktown Heights, New York, June 7-9, 2004.

Acceptance rate 38%.

Wu-chun Feng, Apu Kapadia, and Sunil Thulasidasan, "GREEN: Proactive Queue Management over a Best-Effort Network," In Proceedings of IEEE Global Telecommunications Conference (**GLOBECOM '02**), 21(1):1784-1788, Taipei, Taiwan, November 17-21, 2002.

Acceptance rate 31%.

Jalal Al-Muhtadi, Roy H. Campbell, Apu Kapadia, Dennis Mickunas, and Seung Yi, "Routing Through the Mist: Privacy Preserving Communication in Ubiquitous Computing Environments," In Proceedings of The 22nd IEEE International Conference on Distributed Computing Systems (**ICDCS '02**), pp. 74–83, Vienna, Austria, July 2-5, 2002.

Acceptance rate 18%.

Apu Kapadia, Annette Feng, and Wu-chun Feng, "The Effects of Inter-Packet Spacing on the Delivery of Multimedia Content," In Proceedings of The 21st IEEE International Conference on Distributed Computing Systems (**ICDCS '01**), pp. 665–672, Phoenix, Arizona, April 16-19, 2001.

Acceptance rate 32%.

Apu Kapadia, Jalal Al-Muhtadi, Roy H. Campbell, and Dennis Mickunas, "I-RBAC 2000: Secure Interoperability Using Dynamic Role Translation," In Proceedings of The First International Conference on Internet Computing (**IC '00**), pp. 231–238, Las Vegas, Nevada, June 26-29, 2000.

Acceptance rate unavailable.

Refereed Poster Abstracts and Work-in-Progress Papers

Fabeah Adu-Oppong, Casey K. Gardiner, Apu Kapadia, and Patrick P. Tsang, "Social Circles: Tackling Privacy in Social Networks (Poster Abstract)," To appear in Fourth Symposium on Usable Privacy and Security (**SOUPS '08**), Pittsburgh, Pennsylvania, July 23-25, 2008

Minho Shin, Cory Cornelius, Daniel Peebles, Apu Kapadia, Patrick Tsang and David Kotz, "SenseRight: Reliable People-centric Sensing with Unreliable Participants (Poster Abstract)," The 6th ACM/USENIX International Conference on Mobile Systems, Applications, and Services (**MOBISYS '08**), Breckenridge, Colorado, June 17-20, 2008.

Katelin Bailey, Linden Vongsathorn, Apu Kapadia, Chris Masone, Sean W. Smith, "TwoKind Authentication: Usable Authenticators for Untrustworthy Environments (Poster Abstract)," In Proceedings of the Third Symposium on Usable Privacy and Security (**SOUPS '07**), pp. 169–170, Pittsburgh, Pennsylvania,

July 18–20, 2007.

Patrick P. Tsang, Apu Kapadia, and Sean W. Smith, “Anonymous IP-Address Blocking in Tor with Trusted Computing (Work in Progress),” The Second Workshop on Advances in Trusted Computing (**WATC '06**), Tokyo, Japan, November 30–December 1, 2006.

Raquel Hill, Jalal Al-Muhtadi, Roy Campbell, Apu Kapadia, Prasad Naldurg, Anand Ranganathan, “A Middleware Architecture for Securing Ubiquitous Computing Cyber Infrastructures (Work in Progress),” ACM/IFIP/USENIX Fifth International Middleware Conference (**MIDDLEWARE '04**), Toronto, Canada, October 18th–22nd, 2004. Appears in IEEE Distributed Systems Online, 5(9), September 2004.

Invited Magazine Articles

Apu Kapadia, “A Case (Study) For Usability in Secure Email Communication,” IEEE Security and Privacy, 5(2):80–84, March/April 2007.

Theses

Apu Kapadia, “Models for Privacy in Ubiquitous Computing Environments,” Ph.D. Thesis, University of Illinois at Urbana-Champaign, October 2005.

Apu Kapadia, “I-RBAC 2000: A Dynamic Role Translation Model For Secure Interoperability,” M.S. Thesis, University of Illinois at Urbana-Champaign, May 2001.

Technical Reports

Patrick P. Tsang, Man Ho Au, Apu Kapadia, and Sean W. Smith, “Blacklistable Anonymous Credentials: Blocking Misbehaving Users without TTPs (Extended Version),” Dartmouth Computer Science Technical Report TR2007-601, September 2007.

Peter C. Johnson, Apu Kapadia, David Kotz, and Nikos Triandopoulos, “People-Centric Urban Sensing: Security Challenges for the New Paradigm,” Dartmouth Computer Science Technical Report TR2007-586, Feb 2007.

Apu Kapadia, Prasad Naldurg, and Roy H. Campbell, “Distributed Enforcement of Unlinkability Policies: Looking Beyond the Chinese Wall,” UIUC Technical Report UIUCDCS-R-2006-2689 (UILU-ENG-2006-1718), February 2006.

Apu Kapadia, Prasad Naldurg, and Roy H. Campbell, “Routing with Confidence: A Model for Trustworthy Communication,” UIUC Technical Report UIUCDCS-R-2006-2680 (UILU-ENG-2006-1707), Jan 2006.

Apu Kapadia, Wu-chun Feng, and Roy H. Campbell, “GREEN: A TCP Equation-Based Approach to Active Queue Management,” UIUC Technical Report: UIUCDCS-R-2004-2408/UILU-ENG-2004-1710, February 2004.

Invited Talks

“Accountable Anonymity”

George Mason University, July 2008.

MIT Lincoln Laboratory, June 2008.

Harvard University, April 2008.

Rochester Institute of Technology, April 2008.

Johns Hopkins University, March 2008.

University of Massachusetts Lowell, February 2008.

George Washington University, February 2008.

Towson University, February 2008.

“Nymble: Anonymous IP-Address Blocking”

Microsoft Research India, Bangalore, August 2007.

“Attribute-Based Publishing with Hidden Credentials and Hidden Policies”

Microsoft Research India, Bangalore, August 2007.

“KNOW Why Your Access Was Denied: Usable Security in Ubiquitous Computing”

DOE High-Performance Computer Science Fellowship Conference, June 2005.

“KNOW Why Your Access Was Denied: Usable Security in Ubiquitous Computing”

Presented by Geetanjali Sampemane and Apu Kapadia at CU Infosec, December 2004.

“Routing with Confidence: Supporting User Discretion in Policy Based Networks”

DOE High-Performance Computer Science Fellowship Conference, July 2004.

“Latency Based Triangulation—Augmenting Application Layer Multicast”

Outstanding Class Project, First Annual Illinois Computer Systems Symposium (iCSS), 2002.

Talks at Conferences and Workshops

“AnonySense: Opportunistic and Privacy-Preserving Context Collection”

Sixth International Conference on Pervasive Computing (PERVASIVE '08), Sydney, Australia, May 2008.

“Nymble: Anonymous IP-Address Blocking”

Seventh Privacy Enhancing Technologies Symposium (PETS '07), Ottawa, Canada, June 2007.

“Distributed Enforcement of Unlinkability Policies: Looking Beyond the Chinese Wall”

Eighth IEEE Workshop on Policies for Distributed Systems and Networks (POLICY '07), Bologna, Italy, June 2007.

“Virtual Walls: Protecting Digital Privacy in Pervasive Environments”

Fifth International Conference on Pervasive Computing (PERVASIVE '07), Toronto, Canada, May 2007.

“Attribute-Based Publishing with Hidden Credentials and Hidden Policies”

Fourteenth Annual Network and Distributed System Security Symposium (NDSS '07), San Diego, CA, February/March 2007.

“Anonymous IP-Address Blocking in Tor with Trusted Computing (Work in Progress)”

Second Workshop on Advances in Trusted Computing (WATC '06), Tokyo, Japan, November/December 2006.

“Routing with Confidence: Supporting User Discretion in Policy Based Networks”

Fifth IEEE International Workshop on Policies for Distributed Systems and Networks (POLICY 2004), Yorktown Heights, New York, June 2004.

“GREEN: Proactive Queue Management over a Best-Effort Network”
IEEE Global Telecommunications Conference (GLOBECOM 2002), Taipei, Taiwan, November 2002.

“I-RBAC 2000: Secure Interoperability Using Dynamic Role Translation”
First International Conference on Internet Computing (IC 2000), Las Vegas, Nevada, June 2000.

Professional Activities

Member of Association for Computing Machinery (SigSAC),
The Institute of Electrical and Electronics Engineers (IEEE Computer Society)

Program Committees

ACM Workshop on Privacy in the Electronic Society (WPES), 2008
8th International Privacy Enhancing Technologies Symposium (PETS), 2008
IEEE International Conference on Sensor Networks, Ubiquitous and Trustworthy Computing (SUTC), 2008
ACM Workshop on Privacy in the Electronic Society (WPES), 2007
Third International Workshop on the Value of Security through Collaboration (SECOVAL), 2007
IEEE International Workshop on Trust, Security, and Privacy for Ubiquitous Computing (TSPUC), 2007
International Conference on Computer Communications and Networks (ICCCN), 2006

Session Chairs

ACM Workshop on Privacy in the Electronic Society (WPES), 2007
The Second Workshop on Advances in Trusted Computing (WATC), 2006

Reviewing

ACM Computer and Communications Security (CCS)
ISOC Network and Distributed System Security Symposium (NDSS)
IEEE Pervasive
Mobicom
IFIPTM Joint iTrust and PST Conferences on Privacy, Trust Management and Security
International Workshop on Security for Spontaneous Interaction (IWSSI)
EuroPKI
ACM Computing Surveys
ACM Conference on Object-Oriented Programming Systems, Languages and Applications (OOPSLA)
ACM/USENIX International Conference on Mobile Systems, Applications, and Services (MobiSys)
IEEE International Conference on Distributed Computing Systems (ICDCS)
IEEE International Conference on Communication Systems (ICCS)
Computer Networks, Journal of Computer and Telecommunications Networking, Elsevier
Journal of Systems and Software, Elsevier
JZUS—Journal of Zhejiang University SCIENCE
and others

Other

Co-organizer of ISTS Summer Cryptography Workshop (*Instructor: Patrick P. Tsang*),
Dartmouth College, 2006

Fellowships, Awards, and Admissions Committee
Department of Computer Science, University of Illinois at Urbana-Champaign, 2002

Volunteer
Pattern Languages of Programs Conference (PLoP '99)

Volunteer, Graduate Student Recruiting Campus Tours
University of Illinois at Urbana-Champaign

Peer Advising
Tau Beta Pi

Other Activities

Photography

Chess, Disc Golf, Snow Sports

Volunteering—Asha for Education

Languages—English (native), Spanish (4 semesters), Hindi (fluent), Gujarati (fluent at speaking), Marathi (fair speaking knowledge)

References

Prof. Roy H. Campbell (*Ph.D. Advisor*)
Department of Computer Science
University of Illinois at Urbana-Champaign
201 North Goodwin Avenue
Urbana, IL 61801, USA
Email: rhc@uiuc.edu
Phone: 1-217-333-0215

Prof. Sean W. Smith
Department of Computer Science
Dartmouth College
6211 Sudikoff Laboratory
Hanover, NH 03755, USA
Email: sws@cs.dartmouth.edu
Phone: 1-603-646-1618

Prof. David Kotz
Department of Computer Science
Dartmouth College
6211 Sudikoff Laboratory
Hanover, NH 03755, USA
Email: dfk@cs.dartmouth.edu
Phone: 1-603-646-1439

Dr. Suzanne Thompson (Teaching Reference)
Program Director—Summer Cybersecurity and Robotics Program,
Department of Computer Science
Dartmouth College
6211 Sudikoff Laboratory
Hanover, NH 03755, USA
Email: Suzanne.Thompson@Dartmouth.EDU
Phone: 1-603-646-8439

Prof. Marianne Winslett
Department of Computer Science
University of Illinois at Urbana-Champaign
201 North Goodwin Avenue
Urbana, IL 61801, USA
Email: winslett@uiuc.edu
Phone: 1-217-333-3536