

SALVATORE JOSEPH STOLFO

Salvatorestolfo.com

Curriculum Vitae

As of March 15, 2026

(URL:<http://www.cs.columbia.edu/~sal/>)

Education

Ph.D. Computer Science, October 1979. Courant Institute of Mathematical Sciences, New York University.

Dissertation: *Automatic Discovery of Heuristics for Nondeterministic Programs from Sample Execution Traces*, (fully supported fellowship student).

M.S. Computer Science, June 1976. Courant Institute of Mathematical Sciences, New York University.

B.S. Computer Science and Mathematics, June 1974. Brooklyn College of the City University of New York.

Research Interests

Computer Security, Machine Learning and Cybersecurity, Data Mining-based Intrusion Detection Systems, Machine Learning, Knowledge Discovery in Databases and Data Mining, Parallel Processing and Systems.

My Lab

Columbia University Intrusion Detection Systems Lab, www.cs.columbia.edu/ids, 1996 – present.

Publication H-Index: **106** December 8, 2025, over 49,950 citations (Google Scholar <https://scholar.google.com/citations?user=iLXSMP8AAAAJ&hl=en>)

Professional Employment

- Appointed Morysa Engineering Professor for Connected Humanity, Jan 2025.
- Tenured Professor of Computer Science, Columbia University, June 1997 - present.
- Tenured Associate Professor of Computer Science, Columbia University, May 1986 - June 1997.
- Acting Chairman, Computer Science Department, Columbia University, November 1986 - June 1987.
- Associate Professor of Computer Science, Columbia University, July 1984 - May 1986.
- Assistant Professor of Computer Science, Columbia University, July 1979 - June 1984.
- Lecturer, Department of Computer and Information Science, Brooklyn College of the City University of New York, 1974-1978.

Honors and Awards

- Successfully defended patent litigation, Columbia awarded \$451MM (<https://www.reuters.com/legal/litigation/gen-digital-owes-columbia-481-mln-us-patent-fight-judge-says-2023-10-02/>), 2013-2023.
- ACM Fellow 2019 for contributions to machine learning-based cybersecurity and parallel hardware.
- IEEE Fellow 2018 for contributions to machine learning applied to computer security.
- USENIX Security 2017 Distinguish Paper Award, 2017.
- RAID 2017 Award for most influential paper, dating from 2004.
- Aminer.org Most Influential Scholar 2016, <https://aminer.org/mostinfluentialscholar/security>
- *Popular Science* Award of “What Best of what’s new”, 2016.
- Member of DNI ISTEg committee, 2016-present, and several National Academy Committees.
- Measuring the Human Factor of Cyber Security, (with B. Bowen and R. Devarajan), Proc. IEEE Homeland Security Technology Conference, IEEE HST, 2011. (Best Paper award)
- A Quantitative Analysis of the Insecurity of Embedded Network Devices: Results of a Wide-Area Scan, Ang Cui and Salvatore J. Stolfo, Annual Computer Security Applications Conference, ACSAC, 2010. (Best Paper Award)
- Bright Idea on Information Technology Award, “A link mining algorithm for earnings forecast and trading”, Stillman Business School of Seton Hall University and the New Jersey Business and Industry Association NJPRO Foundation
- Managing Insider Security Threats Workshop (MIST), 2010, Best Paper
- IEEE Security and Privacy, Oakland Conference, Most Influential paper 2010
- Usenix Best Freenix Track Paper Award, MEF: Malicious Email Filter, June 2001
- Service Award, ACM, Program Co-Chair KDD2000, Aug 2000.
- Best Applied Research Award, Mining in a Data-flow Environment: Experience in Network Intrusion Detection, SIGKDD Int. Conference on Knowledge Discovery and Data Mining, Aug, 1999.
- Honorable Mention, Best Application Paper, KDD98 “Mining Audit Data to Build Intrusion Detection Models”, New York, August, 1998.
- Runner Up Best Paper Award, KDD97, “JAM: Java Agents for Meta-Learning”, Newport Beach, CA, August, 1997.
- IBM Faculty Career Development Award.

Consulting and Professional Activities

- Advisor to Glasswing Ventures, December 2017 – present
- Blog Contributor, IDG Contributor Network (ICN), #Notes on Cybersecurity from a Professor-preneur” on CSOnline.com, December 2017 – present
- Chief Technology Officer, Allure Security Technology, December 2017- present.
- Publishing numerous blogs and articles in the commercial security marketplace, including CSOnline, Dark Reading, RSA Blog, Authority Magazine, 2018.

Consultant and Advisor to Government

- National Academies Panel on Army Research Lab evaluation, 2018.
- Member of Intelligence Science and Technology Experts Group (ISTEG), 2015-present.
- Testimony before the DNI Cybersecurity Research Commission, Jan, 2013
- National Academies Panel on Information Science at the Army Research Laboratory, 2012-2014, 2015-2016.
- ODNI/NSA R6 Computational CyberSecurity in Compromised Environments (C3E) Workshop, 2010.
- DARPA IPTO Insider Threat Mitigation Workshop, June 2010.
- DARPA TCTO CyberBio Idea Summit Member, March 2010.
- NSA R6 Steering Committee on Analytics for Cyber Defense, a CNCI Research Workshop, 2009.
- Cyber Security Research Roadmap Invitational Workshop, Oct 7-9, 2008.
- National Academies National Research Council/Naval Studies Board Committee on Information Assurance for Network-Centric Naval Forces, 2008, 2009.
- DARPA IPTO Futures Panel, 2007, 2008.
- DARPA Strategic Information Assurance Program, 2000.
- NSF for Electrical and Computer Engineering Department of the University of Puerto Rico, 1995.
- New York State Science and Technology Foundation, New Business Evaluation, 1989.
- NSF Site Visit Team for NSF, February, 1993.
- NSF Experimental System Program Oversight Committee, July 7, 1989.
- High Tech Subcommittee of the New York City Partnership, 1987 (chaired by J. Lederberg of Rockefeller Univ.).

Member of Formal Committees

- National Academies ISTEG Program member.
- National Academies Panel on Information Science at the Army Research Laboratory, 2012-2014, 2015-2016.
- National Academies National Research Council/Naval Studies Board Committee on Information Assurance for Network-Centric Naval Forces, 2008-2010.
- National Cyber Defense Initiative Steering Committee, 2008.
- Congressional e-Government Task Force, Internet Caucus Advisory Committee, 2000-2001.
- Visa 3D Secure Authenticated Payments Vendor Program, 2000-2001.

Director of Centers

- Center for Applied Research in Digital Government Information Systems 1998.
- Center for Advanced Technology for Computers and Information Systems, School of Engineering and Applied Science, Columbia University, October 1988 - June 1991. (Designated by New York State Science and Technology Foundation.)

Chief Science Advisor

- Allure Security Technology, Inc., 2011 – present.
- CounterStorm (formerly System Detection Inc.), 2001-2006.
- iPrivacy, LLC, (on leave of absence from Columbia), 2000 – 2001.
- Fifth Generation Computer Corp., 1984-1988.

Editorial Board Member

- IEEE Security and Privacy Special Issue on the Science of Security, co-Editor, 2010-2014.
- IEEE Security and Privacy Special Issue on Privacy-Preserving Sharing of Sensitive Information, co-Editor, 2009-2010.
- IEEE Security and Privacy Special Issue on Insider Threat, co-Editor, 2009.
- Journal on Knowledge Discovery and Data Mining, 2005-2008.
- IEEE Security and Privacy, 2005-2008.
- IEEE Signal Processing Special Issue, 2007.
- Machine Learning Journal Special Issue on Integrating Multiple Learned Models for Machine Learning, 1998.
- Journal of Intelligent Information Systems, (Springer, Publishers), 1995-present.

Chair and Co-Chair, Workshops and Conferences

- RAID 2013, PC Chair, 2012-2013.
- RAID 2012, PC Co-Chair, 2011-2012.
- NSF National Cyber Defense Initiative Financial Industry Workshop, Oct 2009.
- ARO/FSTC/I3P Insider Threat Workshop 2007
- NSF/US Department of the Treasury, Workshop on Resilient Financial Information Systems, 2005.
- ACM International Conference on Knowledge Discovery in Databases and Data Mining 2000.
- NSF Workshop on Research and Development (R&D) Opportunities in Federal Information Services, 1996-1997.
- AAAI-97 Workshop on Fraud Detection, 1997.
- AAAI-96 Workshop on Integrating Multiple Models for Improving and Scaling Machine Learning Systems, 1996.

Invited Speaker (recent)

- MIT CSAIL, Oct 2020
- RAID 2017, Most influential award paper, September 2017.
- ICDM Workshop on Data Mining for Security, Nov 2017.
- ACM CCS Workshop on Cyber Deception, October 2017.
- DHS S&T, Embedded System Insecurity, Mar 2013.
- RSA Conference, Breaking Research Session, Advanced Firmware Security, San Francisco, Feb 2013.
- NSF SATC Cyber Café talk, Scalable Deception, Nov 2, 2012.
- West Point Cyber Warrior Club, Automated Reverse Engineering, Nov 5, 2012
- IEEE Webinar to Lockheed Martin, Active Defense, Nov 8, 2012.
- Atlantic Counsel Workshop on Cyber Offense Strategies, Active Defense, Oct 2012.
- DHS PI Meeting, Infrastructure Protection, Oct 2012.
- Insider Threat, I3P 10Year Meeting, National Press Club, Washington, DC, Oct 2012.
- Office of the Secretary of Defense, Scalable Deception, September, 2012.
- Little 10+ IT Auditors Group Annual Meeting, Firmware Risks, June 2012.
- US Army/DARPA, Decoy Technology, Jan 2012
- Defense Science Board, Security Metrics, March 2011

- DHS ITTC Meeting, SRI, June 2011.
- FS Roundtable/BITS, R&D Security Sub-committee, Results of wide area scan, Feb 2011.
- ARO Workshop on Moving Target Defense, Oct 25, 2010
- Cyber Security and Information Intelligence Research Workshop, April 2009.
- InfoSec Research Council, Nov 2008.
- Computer Associates, Insider Threats, Oct 2008.
- Dagstuhl Workshop on Insider Threat, July 2008.
- FORTH Research Institute, Crete, Greece, July 2008.
- ACNS 2008, June 2008.
- NIPS 07 Workshop on Adversarial Learning in Computer Security, Dec 2007
- DIMACS security seminar, April 2006.
- Global Security Consortium, Nov 2005
- DHS/OSTP Invitation only workshop on Critical Infrastructure Protection, Wash. DC, June 2005..
- Security Leadership Conference, May 2005.
- ISMIS Conference, May 2005.
- High Tech Crimes Organization, May 2005.
- Infosec, Collaborative Security, Dec 2004.
- DARPA Application Communities workshop, group leader, Oct 2004.
- Federal Aviation Administration, “Behavior-based Computer Security”, January, 2004.
- InfoSec Research Council Meeting, Hard Technical Problems, “Behavior-based Computer Security”, December, 2003.
- Int. Workshop on Data Mining for Security Applications, IEEE ICDM-2003, November, 2003.
- Griffiss Institute Conference, “Behavior-based Computer Security”, November, 2003.
- *Time* Magazine Board of Technologists, Panel discussion and interview, Oct. 8, 2003.
- International Workshop on Mathematical Methods, Models and Architectures for Computer Networks Security", St. Petersburg, Russia, September 20-24, 2003.
- Government Convention on Emerging Technologies, Defending America Together: The New Era, Las Vegas, Jan, 2003.
- NIST ACIT Workshop on Insider Threat, Feb 2003.
- Griffiss Institute Meeting on Information Assurance and Cyber Security, Utica, Feb 2003,
- Polytechnic University, May 2003.
- Workshop on Machine Learning in Computer Intrusion Detection, GMU, Sept 2003.
- Super Computing Conference 2000, Keynote.
- IBM KDD Colloquium, May, 1999.
- Advance Information Technologies for Government Conference, Washington D.C., September, 1998, Keynote.

Invited Panelist

- RSA Conference 2012, Panelist on Embedded System Security research, Feb 2012
- RSA Conference 2011, Panelist on Future Cybersecurity research, Feb 2011
- Cyber Security and Information Intelligence Research Workshop, April 2009.
- KDD98, Distributed Data Mining Workshop, August, 1998.
- EXPO ITCA '98 Collaborative Communications, Microsoft's "Lock", March 1998.

- New York Bar Association Meeting on Antitrust Law, and DOJ vrs. Microsoft, February, 1998.
- New York Academy of Science/Mitretek Systems Workshop on Issues in Internet Payment Systems, January 1998.
- AI Meets the Real World Conference, Stamford, CT, September 1998.
- NSF CAREER Program, February 1997.
- ARPA-ITO General PI Meeting, Dallas, October, 1996.
- 4th International Workshop on Research Issues in Data Engineering - Active Databases, Houston, TX, Feb. 1994.
- Tools with AI Conf., Washington, D.C., November, 1992.
- NSF Program on Scientific Databases, July 1991

Invited Participant

- NSF Workshop on Future of Trustworthy Computing, Oct 28, 2010
- ARO Workshop on Moving Target Defense, Oct 25, 2010
- ODNI/NSA R6 Computational Cybersecurity in Compromised Environments (C3E) Workshop, 2010.
- DARPA IPTO Insider Threat Mitigation Workshop, June 2010.
- DARPA TCTO CyberBio Idea Summit Member, March 2010.
- ONR/NSF/DHS Workshop on Cyber security Data Gap Analysis, MIT, Oct, 2009.
- Schloss Dagstuhl Seminar on Insider Threat, Wadern, Germany, 2008.
- DARPA ISAT study on machine learning research, 2006.
- NSA/DTO invitation only workshops on privacy research for the Intelligence Community 2006
- ARDA Advanced Malware Roadmap and Challenge Problem Workshops, 2005.
- Briefings on Columbia IDS Research at White House, Office of Secretary of Defense, DISA, Mitre, CISCO, EDS, Symantec, NSIE, Rome Labs, Lucent, InQTel, Ft. Meade, SAIC, ARDA.
- DARPA Information Assurance and Survivability Workshop, St. Louis, May, 1999.
- White House OSTP, DOE, NSC Invitation Only Workshop on Detection of Malicious Code, Intrusions, and Anomalous Activity, Washington, D.C., February, 1999.
- Schloss Dagstuhl Seminar on Active Databases, Wadern, Germany, March, 1994.
- Check Truncation Project, Financial Systems Technology Consortium.
- First DARPA Workshop on Intelligent Information Integration Systems, Knowledge Acquisition Working Group, Reston, VA, March 1993.
- NSF Workshop on HPCC and AI, February 1992.
- Citicorp Strategic Technology Evaluation Program, Citicorp, June 1988 - 1994.

Program Committee Member (recent)

- AAAI19 Workshop on AI for Cyber Security (AICS) 2019
- IEEE Security Development Conference (SecDev) 2018
- RAID 2017
- WRIT 2013, WRIT 2018 (Workshop on Insider Threat, IEEE S&P Symposium) PC
- RAID 2013 PC Chair
- ACM CCS 2012

- RAID 2012 PC Co-Chair
- *IEEE HST 2011*
- CAEIA-IT Workshop, 2010.
- ACM CCS 2007, 2008, 2013.
- CEAS 2006.
- DHS CATCH 2009.
- RAID 2005, 2006, 2007, 2008, 2012, 2013.
- Usenix Security 2006.
- DIMVA 2009.
- IEEE Security and Privacy, Oakland, 2006.
- Int. Conference on KDD, ACM, 2002, 2005
- Worms 2005
- NSF/NIJ Symposium on Intelligence and Security Informatics, 2004, 2005.
- Applied Cryptography and Network Security (ACNS 2004), June 2004
- 4th IEEE Int. Conference on Data Mining 2004
- Int. Workshop Mathematical Methods, Models and Architectures for Computer Networks Security, 2003.
- DARPA DISCEX III Conference, Apr 2003.
- International Conference on Machine Learning 1998.
- International Conference on Knowledge Discovery in Databases and Data Mining 1998.
- International Conference on Knowledge Discovery in Databases and Data Mining, 1997.
- International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS '97), 1996-1997.
- National AI Conference, AAAI96, 1996.
- International Conference on Knowledge Discovery in Databases and Data Mining, 1996.
- 4th International Workshop on Research Issues in Data Engineering, (in conjunction with IEEE CS International Conference on Data Engineering), Houston, Tx, Feb. 1994.
- Eight International Symposium on Methodologies for Intelligent Systems, North Carolina, June 1994.
- National Conference on Artificial Intelligence, (AAAI-92), 1992.

Technical Advisory Boards

- Financial Systems Technology Consortium, Security Standing Committee, 2006.
- Risk Insight, Inc., Menlo Park, CA, 2005
- StackSafe Inc., (formerly Revive Systems, Inc.) Vienna, VA, 2006
- Griffiss Institute, NY, 2005

Expert Witness

- Computer and Communications Industry Association Amicus Brief in support of Department of Justice vrs Microsoft Corporation, November, 1997.

Session Chair/Moderator

- HotSoS (Hot Topics in Science of Security), Hard Problems Session, 2021.
- RAID 2012

- International Joint Conference on AI, Workshop on Parallel Production Systems, France, August, 1993.
- National Conference on Artificial Intelligence, (AAAI-92), July 1992.
- IFIP Workshop on Principles of Knowledge Based Systems, Mt. Fuji, Japan, November, 1987.
- IEEE International Conference on Parallel Processing, 1985.
- Expert Systems in Government Conference, IEEE, 1985.

Consultant

- DARPA IPTO, 2008, 2009.
- StackSafe Inc. 2006-2008.
- Citicorp Strategic Technology Evaluation Program, Citicorp, June 1988 - 1994.
- AT&T Bell Laboratories (Whippany), Knowledge-Based Expert Systems Project, 1980-1985. (Implemented a working expert system, called ACE, that has developed into an AT&T product).
- Various law firms for advise on certain legal matters
- iPrivacy LLC., System Detection Inc., BAE, CACI, and various other companies

Lecturer

- Bell Telephone Laboratories, 1981.
- Department of Computer Science, New York University, 1978-1979.

Reviewer and PC's numerous journals, technical workshops and symposia, including:

- Journal of Machine Learning Research
- IEEE Homeland Security Technology
- IEEE Transactions on Dependable Systems
- IEEE Transactions on Signal Processing
- IEEE Security and Privacy
- IEEE ICDM
- IEEE Transactions on Knowledge and Data Engineering,
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Computer Magazine
- IEEE Security and Privacy Symposium
- NSF/NIJ Symposium on Intelligence and Security Informatics
- Conf on Dependable Systems
- RAID confernece
- ACM KDD
- ACM Modeling, Analysis and Simulation Conference
- ACM Computer Architecture Conference
- ACM Computer and Communications Security
- Journal of Intelligent Information Systems
- Journal of Parallel and Distributed Computing
- International Journal of Tools with AI

- NSF and NSF PYI proposals in the area of Knowledge and Data Base Systems, and Computer Architectures 1987-1994
- NSF Panels on Security research and Expeditions proposals
- International Conference on Parallel Processing,
- 1988 International Conference on Fifth Generation Computing Tokyo, Japan, 1992
- AAAI Conference,
- RIDE Workshop
- ISMIS Conference,
- KDD Conference
- Parallel Computing Journal
- International Conference on Machine Learning

Media

- Reuters, <https://www.reuters.com/legal/litigation/gen-digital-owes-columbia-481-mln-us-patent-fight-judge-says-2023-10-02/>
- Dark Reading, <https://www.darkreading.com/risk/truncated-urls-look-to-make-big-dent-in-phishing/a/d-id/1338969>
- Campus Safety, <https://www.campussafetymagazine.com/university/protecting-university-students-and-faculty-from-phishing-scams/>
- Dark Reading, <https://www.darkreading.com/vulnerabilities---threats/things-keeping-cisos-up-at-night-during-the-covid-19-pandemic/a/d-id/1337675>
- IT Business, Net, <https://www.itbusinessnet.com/2020/04/protecting-customers-from-phishing-scams-during-the-covid-19-pandemic/>
- Huffington Post: https://www.huffpost.com/entry/coronavirus-scams-fraud_1_5e82446dc5b603fbdf477a26
- Dark Reading: <https://www.darkreading.com/vulnerabilities---threats/this-taxseason-save-the-scorn-and-protect-customers-from-phishing-scams/a/d-id/1337279>
- Forbes: <https://www.forbes.com/sites/forbestechcouncil/2020/02/07/have-no-fear-of-active-defense/#53348c657366>
- CPO Magazine, <https://www.cpomagazine.com/cyber-security/why-phishing-threatens-your-brands-integrity/>
- Scott Amyx interview: <https://lnkd.in/dGkkvQv>
- Forbes: <https://www.forbes.com/sites/forbestechcouncil/2019/10/09/11-traditionally-manual-business-functions-that-should-be-automated/#1d32e3816e3c>
- Information Security Buzz: <https://www.informationsecuritybuzz.com/articles/three-lessons-for-brands-from-the-youtube-phishing-attack/>
- SC Magazine, Upping the Threat Intel Quotient of Incident Response, Oct. 2019.
- Forbes Technology Council, <https://member.forbestechcouncil.com/articles/published>
- Security Boulevard, <https://securityboulevard.com/2019/08/what-unique-cloud-document-indicators-can-reveal-about-data-loss-risk/>
- Dark Reading, <https://www.darkreading.com/threat-intelligence/rethinking-website-spoofing-mitigation/a/d-id/1335427>

- CSOnline (<http://www.csoonline.com/author/Salvatore-Stolfo>),
- Dark Reading (<https://www.darkreading.com/perimeter/deception-honey-vs-real-environments-/a/d-id/1333464>, <https://www.darkreading.com/perimeter/hack-back-an-eye-for-an-eye-could-make-you-blind/a/d-id/1331432?print=yes>),
- RSA Blog (<https://www.rsaconference.com/blogs/hipaa-gdpr-and-the-dreaded-second-hop-security-problem>),
- Authority Magazine (<https://medium.com/authority-magazine/rest-assured-its-under-control-using-ai-technology-to-protect-your-personal-information-34c73675966d>, <https://medium.com/authority-magazine/the-future-is-now-now-we-can-deceive-and-track-the-hackers-with-dr-5d48b91883c6>), 2018.
- Rolling the Dice on AI, SC Magazine, June 109. <https://www.scmagazine.com/home/security-news/rolling-the-dice-on-ai/>.
- Steptoe Podcast, Nov 2014. <https://www.lawfareblog.com/steptoe-cyberlaw-podcast-episode-44-interview-sal-stolfo>
- Hacking Cisco IP Phones
<http://bits.blogs.nytimes.com/2013/02/05/a-guide-to-spying-on-cisco-phone-calls/>
<http://redtape.nbcnews.com/news/2013/01/04/16328998-popular-office-phones-vulnerable-to-eavesdropping-hack-researchers-say?lite&ocid=msnhp&pos=1>
http://www.washingtonpost.com/world/national-security/to-thwart-hackers-firms-salting-their-servers-with-fake-data/2013/01/02/3ce00712-4afa-11e2-9a42-d1ce6d0ed278_story.html?hpid=z4
- Symbiote Technology, Scientific American, Nov 2012, https://www.scientificamerican.com/article.cfm?id=new-symbiote-may-protect-microchips-from-cyberattack&WT.mc_id=SA_sharetool_StumbleUpon
- Hacking attacks on printers still not being taken seriously, The Guardian, July 23, 2012, <http://www.guardian.co.uk/technology/2012/jul/23/hacking-attack-printers>
- Feds Look to Fight Leaks With ‘Fog of Disinformation’, Wired Magazine, July 3, 2012, <http://www.wired.com/dangerroom/2012/07/fog-computing/2/>
- <http://redtape.nbcnews.com/news/2013/01/04/16328998-popular-office-phones-vulnerable-to-eavesdropping-hack-researchers-say?lite&ocid=msnhp&pos=11>
- Active Authentication and decoy technology
 - <http://www.nytimes.com/2012/03/18/business/seeking-ways-to-make-computer-passwords-unnecessary.html?partner=rss&emc=rss>
 - http://www.washingtonpost.com/world/national-security/to-thwart-hackers-firms-salting-their-servers-with-fake-data/2013/01/02/3ce00712-4afa-11e2-9a42-d1ce6d0ed278_story.html?hpid=z4
 - NPR Radio interview, Marketplace Tech Report, HP vulnerability, Nov 2011.
 - New York Times, Business section, Digital Domain, Seeking Ways to Make Passwords Unnecessary, March 17, 2012, <http://www.nytimes.com/2012/03/18/business/seeking-ways-to-make-computer-passwords-unnecessary.html?partner=rss&emc=rss>
 - NPR Radio interview, Marketplace Tech Report, on research to replace password, Decoy technology, March 2012
- HP Printer Flaws, MSNBC, <http://redtape.msnbc.msn.com/news/2011/11/29/9076395-exclusive-millions-of-printers-open-to-devastating-hack-attack-researchers-say>
- Wired Magazine, interview concerning Decoy Technology. Nov 2011 <http://www.wired.com/dangerroom/2011/11/darpa-trap-wikileaks/>

- *Time Magazine*, “Cyberdefense”, November 10, 2003.
- *Trusted Information Systems Magazine*, “The JAM Project”, March 1998.
- *Associated Press Newswire*, Egs. The Bergen Record pp. E3, Staten Island Advance, “ATT accused of High-Tech Piracy”, October 17, 1991.
- *New York Times*, “Scientists Bet on New Design”, Science Times Section, pp. C1, Tuesday, October 23, 1984.
- *Manhattan Inc*, “Silicon Island”, pp. 107-116, March 1986.

Issued Patents

111	12,225,035	Systems, Methods, and Media for Defending Computing Systems From Attack K
110	12,079,345	Methods, Systems, and Media for Testing Insider Threat Detection Systems
109	11,841,966	Inhibiting Memory Disclosure attacks using destructive code reads
108	11,831,418	System, methods and media for defending computing systems from attack
107	11,374,960	Methods, Systems and Media for Evaluating Layered Computer Security Products
106	11,361,083	Method and Apparatus for Security Embedded Device Firmware
105	11,310,249	Systems, methods, and media for defending computing systems from attack
104	11,288,090	Methods, Systems, and Media for Injecting Code into Embedded Devices
103	11,227,056	Inhibiting memory disclosure attacks using destructive code reads
102	11,194,915	Methods, systems, and media for testing insider threat detection systems
101	11,106,799	Methods, media, and systems for detecting an anomalous sequence of function calls
100	10,902,111	Methods, media, and systems for detecting attack on a digital processing device
99	10,891,375	Document Behavior Analytics- Abnormal Document Flows to Identity Suspicious Exfiltration
98	10,887,340	Methods, systems, and media for inhibiting attacks on embedded devices
97	10,819,726	Detecting network anomalies by probabilistic modeling of argument strings with markov chains
96	10,686,836	Host-based deception security technology
95	10,673,884	Apparatus method and medium for tracing the origin of network transmissions using n-gram distribution of data
94	10,657,262	Method and apparatus for securing embedded device firmware
93	10,650,087	Systems and methods for content extraction from a mark-up language text
92	10,594,722	Methods, systems and media for evaluating layered computer security products
91	10,476,908	Generating highly realistic decoy email and documents
90	10,423,788	Methods, media, and systems for detecting an anomalous sequence of function calls
89	10,341,378	Methods, systems, and media for inhibiting attacks on embedded devices
88	10,305,919	Systems and methods for inhibiting attacks on applications
87	10,181,026	Methods, media, and systems for detecting attack on a digital processing device
86	10,178,113	Systems, methods, and media for generating sanitized data, sanitizing anomaly detection models, and/or generating sanitized anomaly detection models

85	10,178,104	Methods, media, and systems for securing communications between a first node and a second node
84	10,146,939	Systems, methods, and media for outputting a dataset based upon anomaly detection
83	10,069,854	Methods, Systems and Media for Evaluating layered Computer Security Products
82	10,063,576	Detecting network anomalies by probabilistic modeling of argument strings with markov chains
81	10,063,574	Apparatus method and medium for tracing the origin of network transmissions using N-gram distribution of data
81	10,061,753	Systems and methods for content extraction from a mark-up language text accessible at an internet domain
80	10,055,251	Methods, systems, and media for injecting code into embedded devices
79	10,038,704	Systems and methods for correlating and distributing intrusion alert information among collaborators
78	10,025,929	Detection of anomalous program execution using hardware-based micro-architectural data
77	10,002,249	Systems, methods, and media for outputting data based on anomaly detection
76	9,996,694	Unsupervised detection of anomalous processes using hardware features
75	9,971,891	Methods, systems, and media for detecting covert malware
74	9,870,455	System Level User Behavior Biometrics using feature extraction and modeling
73	9,654,478	Methods, media and systems for securing communications between a first node and a second node
72	9,576,127	Methods, media, and systems for detecting attack on a digital processing device
71	9,544,322	Systems, methods, and media protecting a digital data processing device from attack
70	9,519,778	Systems, methods, and media for outputting a dataset based upon anomaly detection
69	9,501,639	Methods, systems, and media for baiting inside attackers
68	9,497,203	System and methods for model generation for detecting intrusion in computer systems
67	9,450,979	Methods, media, and systems for detecting an anomalous sequence of function calls
66	9,419,981	Methods, media, and systems for securing communications between a first node and a second node
65	9,392,017	Methods, systems, and media for inhibiting attacks on embedded devices, July 12, 2016
64	9,372,838	Systems and methods for content extraction from mark-up language text accessible at an internet domain
63	9,356,957	Systems, methods, and media for generating bait information for trap-based defenses
62	9,338,174	Systems and methods for inhibiting attacks on applications
61	9,311,476	Methods, systems, and media for masquerade attack detection by monitoring computer user behavior
60	9,306,966	Methods of unsupervised anomaly detecting using a geometric framework
59	9,276,950	Apparatus, method and medium for detecting payload anomaly using N-gram distribution of normal data
58	9,275,345	System level user behavior biometrics using feature extraction and modeling, March 1, 2016.
57	9,253,201	Detecting network anomalies by probabilistic modeling of argument strings with markov chains

56	9,143,518	Systems, methods, and media protecting a digital data processing device from attack
55	9,135,438	Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems
54	9,088,596	Systems, methods, and media for generating sanitized data, sanitizing anomaly detection models, and/or generating sanitized anomaly detection models
53	9,009,829	Methods, systems, and media for baiting inside attackers
52	9,003,528	Apparatus method and medium for tracing the origin of network transmissions using N-gram distribution of data
51	9,003,523	Systems, methods, and media for outputting data based upon anomaly detection
50	8,931,094	System and methods for detecting malicious email transmission
49	8,893,273	Systems and methods for adaptive model generation for detecting intrusions in computer systems
48	8,887,281	System and methods for adaptive model generation for detecting intrusion in computer systems
47	8,844,033	Systems, methods, and media for detecting network anomalies using a trained probabilistic model
46	8,819,825	Systems, methods, and media for generating bait information for trap-based defenses
45	8,789,172	Methods, media, and systems for detecting attack on a digital processing device
44	8,769,684	Methods, systems, and media for masquerade attack detection by monitoring computer user behavior
43	8,763,103	Systems and methods for inhibiting attacks on applications
42	8,694,833	Methods, media, and systems for detecting an anomalous sequence of function calls
41	8,667,588	Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems
40	8,644,342	Apparatus method and medium for detecting payload anomaly using N-gram distribution of normal data
39	8,601,322	Methods, media, and systems for detecting anomalous program executions
38	8,544,087	Methods of unsupervised anomaly detection using a geometric framework
37	8,528,091	Methods, systems, and media for detecting covert malware
36	8,489,931	Methods, media, and systems for detecting an anomalous sequence of function calls
35	8,468,445	Systems and methods for content extraction
34	8,448,242	Systems, methods, and media for outputting data based upon anomaly detection
33	8,443,441	System and methods for detecting malicious email transmission
32	8,407,785	Systems, methods, and media protecting a digital data processing device from attack
31	8,407,160	Systems, methods, and media for generating sanitized data, sanitizing anomaly detection models, and/or generating sanitized anomaly detection models
30	8,381,299	Systems, methods, and media for outputting a dataset based upon anomaly detection
29	8,381,295	Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems
28	8,239,687	Apparatus method and medium for tracing the origin of network transmissions using n-gram distribution of data
27	8,135,994	Methods, media, and systems for detecting an anomalous sequence of function calls
26	8,074,115	Methods, media and systems for detecting anomalous program executions

25	7,996,288	Method and system for processing recurrent consumer transactions
24	7,979,907	Systems and methods for detection of new malicious executables
23	7,962,798	Methods, systems and media for software self-healing
22	7,913,306	System and methods for detecting intrusions in a computer system by monitoring operating system registry accesses
21	7,818,797	Methods for cost-sensitive modeling for intrusion detection and response
20	7,784,097	Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems
19	7,779,463	Systems and methods for correlating and distributing intrusion alert information among collaborating computer systems
18	7,752,665	Detecting probes and scans over high-bandwidth, long-term, incomplete network traffic information using limited memory
17	7,657,935	System and methods for detecting malicious email transmission
16	7,639,714	Apparatus method and medium for detecting payload anomaly using n-gram distribution of normal data
15	7,487,544	System and methods for detection of new malicious executables
14	7,448,084	System and methods for detecting intrusions in a computer system by monitoring operating system registry accesses
13	7,424,619	System and methods for anomaly detection and adaptive learning
12	7,277,961	Method and system for obscuring user access patterns using a buffer memory
11	7,225,343	System and methods for adaptive model generation for detecting intrusions in computer systems
10	7,162,741	System and methods for intrusion detection with dynamic window sizes
9	5,920,848	Method and system for using intelligent agents for financial transactions, services, accounting, and advice
8	5,748,780	Method and apparatus for imaging, image processing and data compression
7	5,717,915	Method of merging large databases in parallel
6	5,668,897	Method and apparatus for imaging, image processing and data compression merge/purge techniques for document image databases
5	5,563,783	Method and system for securities pool allocation
4	5,497,486	Method of merging large databases in parallel
3	5,363,473	Incremental update process and apparatus for an inference system
2	4,860,201	Binary tree parallel processor
1	4,843,540	Parallel processing method

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- 1 [20100153785](#) [METHODS, MEDIA, AND SYSTEMS FOR DETECTING AN ANOMALOUS SEQUENCE OF FUNCTION CALLS](#)
- 2 [20100146615](#) [Systems and Methods for Inhibiting Attacks on Applications](#)
- 3 [20100077483](#) [METHODS, SYSTEMS, AND MEDIA FOR BAITING INSIDE ATTACKERS](#)

- 4 [20100064369 METHODS, MEDIA, AND SYSTEMS FOR DETECTING ATTACK ON A DIGITAL PROCESSING DEVICE](#)
- 5 [20100064368 Systems, Methods, and Media for Outputting a Dataset Based Upon Anomaly Detection](#)
- 6 [20100054278 APPARATUS METHOD AND MEDIUM FOR DETECTING PAYLOAD ANOMALY USING N-GRAM DISTRIBUTION OF NORMAL DATA](#)
- 7 [20100023810 METHODS, MEDIA AND SYSTEMS FOR DETECTING ANOMALOUS PROGRAM EXECUTIONS](#)
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- 14 [20080262985 SYSTEMS, METHODS, AND MEDIA FOR GENERATING SANITIZED DATA, SANITIZING ANOMALY DETECTION MODELS, AND/OR GENERATING SANITIZED ANOMALY DETECTION MODELS](#)
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1. Simulated User Bots: Real Time Testing of Insider Threat Detection Systems, Preetam Dutta, Gabriel Ryan, Aleksander Zieba and Salvatore Stolfo, IEEE Symp on Security and Privacy, Workshop on Research for Insider Threat, March 2018.
2. Fox in the Trap: Thwarting Masqueraders via Automated Decoy Document Deployment, Jonathan Voris, Jill Jermyn, Nathaniel Boggs and Salvatore Stolfo, ACM European Workshop on System Security, 2015.
3. Model Aggregation for Distributed Content Anomaly Detection, Sean Whalen, Nathaniel Boggs and Sal Stolfo, AI Security Workshop, CCS, 2014.
4. On the Use of Decoy Applications for Continuous Authentication on Mobile Devices, Malek Ben Salem, Jon Voris and Salvatore Stolfo, Who are you?! Adventures in Authentication: WAY Workshop (WAY) 2014.
5. System level user behavior biometrics using Fisher features and Gaussian mixture models, (w. Y. Song, M. Ben Salem and S. Hershkop), Workshop on Research in Insider Threat (WRIT), 2013.

6. "The MEERKATS Cloud Security Architecture", (with Angelos D. Keromytis, Roxana Geambasu, Simha Sethumadhavan, Salvatore J. Stolfo, Junfeng Yang, Azzedine Benameur, Marc Dacier, Matthew Elder, Darrell Kienzle, and Angelos Stavrou), In Proceedings of the 3rd International Workshop on Security and Privacy in Cloud Computing (ICDCS-SPCC), pp. 446 - 450. June 2012, Macao, China.
7. Fog Computing: Mitigating Insider Data Theft Attacks in the Cloud. Salvatore J Stolfo, Malek Ben Salem and Angelos Keromytis, Workshop on Research on Insider Threats, WRIT, 2012.
8. Lost in Translation: Improving Decoy Documents via Automated Translation, Jonathan Voris, Nathaniel Boggs and Salvatore Stolfo, Workshop on Research on Insider Threats, WRIT, 2012.
9. Concurrency Attacks, (with Junfeng Yang, Ang Cui, Sal Stolfo and Simha Sethumadhavan), Proceedings USENIX Workshop on Hot Topics in Parallelism (HotPar), 2012.
10. ALDR: A New Metric for Measuring Effective Layering of Defenses, (with N. Boggs), ACM CCS Layered Assurance Workshop (LAW), 2011.
11. On the Design and Execution of Cyber-security User Studies: Methodology, Challenges, and Lessons Learned, (with M. Ben Salem), Proc. 4th Workshop on Cyber Security Experimentation and Test (CSET '11), 2011.
12. Killing the Myth of Cisco IOS Diversity: Towards Reliable, Large-Scale Exploitation of Cisco IOS, (with A. Cui and J. Kataria), USENIX Security Workshop on Offensive Technologies (WOOT '11), 2011. (Talk presented at Black Hat 2011)
13. "The MINESTRONE Architecture: Combining Static and Dynamic Analysis Techniques for Software Security" (with Angelos D. Keromytis, Salvatore J. Stolfo, Junfeng Yang, Angelos Stavrou, Anup Ghosh, Dawson Engler, Marc Dacier, Matthew Elder, and Darrell Kienzle), In Proceedings of the 1st Workshop on Systems Security (SysSec). July 2011, Amsterdam, Netherlands.
14. "The SPARCHS Project: Hardware Support for Software Security", (with Simha Sethumadhavan, Salvatore J. Stolfo, David August, Angelos D. Keromytis, and Junfeng Yang), In Proceedings of the 1st Workshop on Systems Security (SysSec). July 2011, Amsterdam, Netherlands.
15. Reflections on the Engineering and Operation of a Large-scale Embedded Device Vulnerability Scanner, (with A. Cui), Building Analysis Datasets and Gathering Experience Returns for Security, (BADGERS), April, 2011.
16. Detecting Masqueraders: A Comparison of One-Class Bag-of-Words User Behavior Modeling Techniques", Malek Ben Salem and Salvatore J. Stolfo, Insider Threat Workshop MIST 2010. (Best Paper Award)
17. Keep Your Friends Close: The Necessity for Updating an Anomaly Sensor with Legitimate Environment Changes, (with G. Cretu-Ciocarlie, A. Stavrou, M. Locasto), ACM Computer and Communications Security Conf. Workshop AI in Security, AISEC, 2009.
18. Return Value Predictability Profiles for Self—Healing, (with M. E. Locasto, A. Stavrou, G. F. Cretu, A. D. Keromytis), Third International Workshop on Security (IWSEC 2008), 2008.
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20. Fileprints: Identifying File Types by n-gram Analysis, (with W. Li, K. Wang, and Benjamin Herzog), 6th IEEE Information Assurance Workshop, May 2005.
21. Towards Collaborative Security and P2P Intrusion Detection, (with M. E. Locasto, J. J. Parekh, and A D. Keromytis), 6th IEEE Information Assurance Workshop, May 2005.

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23. One-Class Training for Masquerade Detection, (with K. Wang), 3rd IEEE International Conference on Data Mining, Workshop on Data Mining for Security Applications, Florida, Nov., 2003.
24. One Class Support Vector Machines for Detecting Anomalous Window Registry Accesses, (with K. Heller, K. Svore, A. Keromytis), 3rd IEEE International Conference on Data Mining, Workshop on Data Mining for Security Applications, Florida, Nov., 2003.
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30. Adaptive Model Generation for Intrusion Detection, (with E. Eskin, M. Miller, Z. Zhang, G. Yi, L. Wei-Ang), Proc. ACM CCS Workshop on Intrusion Detection and Prevention, 2000.
31. Cost complexity-based pruning of ensemble classifiers (with A. Prodromidis), ACM SIGKDD Workshop on Distributed and Parallel Knowledge Discovery, 2000.
32. Towards Automatic Intrusion Detection Using NFR, (with W. Lee and C. Park), In the 1st USENIX Workshop on Intrusion Detection and Network Monitoring, 1999.
33. Using conflicts among multiple base classifiers to measure the performance of stacking, (with W. Fan, and P. Chan), Working Notes ICML-99 Workshop on Recent Advances in Meta-Learning, 1999.
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35. Pruning Classifiers in a Distributed Meta-Learning System, (with A. Prodromidis and P. K. Chan), KDD98 Workshop on Distributed Data Mining, 1998.
36. Data Mining over Distributed Databases and its Application to Fraud and Intrusion Detection in Financial Information Systems, NSF Workshop on R&D Opportunities in Federal Information Services, May 1997.
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38. Credit Card Fraud Detection Using Meta-Learning: Issues and Initial Results with (D. Fan, W. Lee, A. Prodromidis and P. Chan), AAAI 97 Workshop on AI Approaches to Fraud Detection and Risk Management, 1997.
39. JAM: Java Agents for Meta-Learning for Distributed Data Mining, (with A. Prodromidis, S. Tselepis, W. Lee, W. Fan and P. Chan), AAAI 97 Workshop on AI Approaches to Fraud Detection and Risk Management, 1997.

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1. [Tug-of-War: Observations on Unified Content Handling](#) T Petsios, A Tang, D Mitropoulos, S Stolfo... - arXiv preprint arXiv:1708.09334, 2017
2. Does profiling make us more secure? Pfleeger, S.L., Rogers, M., Bashir, M., Caine, K., Caputo, D., Losavio, M., Stolfo, S. 2012, IEEE Security and Privacy 10 (4) , art. no. 6265096 , pp. 10-15
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5. Dark Reading https://www.darkreading.com/author-bio.asp?author_id=4946&
6. CSO Online <https://www.csoonline.com/author/Salvatore-Stolfo/>
7. ISACA Journal <http://www.isaca.org/Journal/archives/2019/Volume-1/Pages/cost-of-a-data-breach.aspx>
8. HelpNet Security GE Trade Secret Theft Case Demonstrates Need for Document Behavior Monitoring <https://www.helpnetsecurity.com/2019/04/29/document-behavior-monitoring/>
9. BlackHat
<https://www.blackhat.com/eu-17/speakers/Salvatore-Stolfo.html>
<https://www.blackhat.com/us-13/speakers/Salvatore-Stolfo.html>
10. Channel Futures To appear
11. SC Magazine <https://www.thecontentfirm.com/images/user/other/Last-Minute-GDPR.pdf>
12. Wired <https://www.wired.com/2012/07/fog-computing/>
13. Allure Security Blog <https://www.alluresecurity.com/blog>

Technical Reports

1. "Smashing the Stack with Hydra: The Many Heads of Advanced Polymorphic Shellcode", Pratap V. Prabhu Yingbo Song and Salvatore J. Stolfo, 2010.
2. Automatically Parallelizing Legacy Binary Code for MultiCore Architectures, (with D. August, M. Locasto and S. Sethumadhavan), AFRL-RY-WP-TR-2009, DARPA Seedling final report, August 2009.
3. BARTER: A Model Exchange Access Control and Communication Framework for Secure Content Mobile Ad-hoc Networks, (with V. Frias-Martinez), CU Tech Report,
4. Quantifying Application Behavior Space for Detection and Self-Healing, (with M. Locasto, A. Stavrou, G. Cretu and A. Keromytis), CU Tech Report 017-06,
5. Privacy-Preserving Payload-Based Correlation for Accurate Malicious Traffic Detection, (with J. Parekh, and K. Wang), CU Tech Report 026-06, May 2006
6. Host-based Anomaly Detection Using Wrapping File Systems, Shlomo Hershkop, Ryan Ferster, Linh H. Bui, Ke Wang and Salvatore J. Stolfo. *CU Tech Report* April 2004.
7. Collaborative Distributive Intrusion Detection, Michael E. Locasto, Janak J. Parekh, Salvatore J. Stolfo, Angelos D. Keromytis, Tal Malkin, Vishal Misra. *CU Tech Report CUCS-012-04*, 2004.
8. EMT/MET: Systems for Modeling and Detection of Errant Email, DARPA DISCEX III, April 2003.
9. Database Research at Columbia University, (with S. Chang, L. Gravano, G. Kaiser, K. Ross), SIGMOD Record, Vol 27, No. 3, September 1998, 75-80.
10. Approximate String Matching on the DADO Parallel Computer, (with T. Mori), Department of Computer Science Technical Report, Columbia University, 1988.
11. A Note on Implementing OPS5 Production Systems on DADO, Department of Computer Science Technical Report, Columbia University, 1984.
12. ||PSL: A Parallel Lisp for the DADO Machine (with M. van Biema, M. Lerner, and G. Maguire), Department of Computer Science Technical Report, Columbia University, 1984.
13. Research Issues in the Development of Expert Systems, (with G. Vesonder, F. Miller, J. Zielinski, and D. Copp), Bell Labs Technical Memorandum, May, 1983.

Technical Presentations

1. Deception in Depth, KTH Stockholm invited, June 2018.
2. An overview of Machine Learning Applied to Security invited, AICS Workshop, Feb 2018.
3. Open Challenges in Machine Learning and Security, ICDM Invited, November, 2017.
4. A brief history of Symbiote Defense, MIT/CSAIL, NYU, UPenn, Dartmouth, October 2017.
5. Deception Security and Active Authentication: How to Protect your Data For real, Dartmouth, Nov 2017, MongoDB invitation, April 2018.
6. Deception Security and Active Authentication, First International Workshop on Cyber Deception and Defenses, 2017.
7. RSA 2015, Hot Research Topics: Symbiote Technology, Decoy Technology, April 2015.
8. Office of the Secretary of the Air Force, Embedded Insecurity, January 2015.
9. AFEI Conference, CyberWest, DHS invitational talk on Symbiote technology.
10. DHS Embedded System Insecurity, Mar 2013.
11. DoD OSD (Pentagon), Cisco IP Phone vulnerabilities, February 2013
12. DHS Briefing, Cisco IP Phone vulnerabilities, January 2013
13. IARPA Briefing, Cisco IP Phone vulnerabilities, January 2013

14. Amphion Forum, Cisco IP Phone vulnerabilities, San Francisco, Dec 2012.
15. Embedded Systems Security, RSA Panel, 2012
16. Embedded Insecurity, Symantec, Feb 2012
17. Killing the Myth of Cisco IOS Diversity, Black Hat 2011
18. Security Metrics, Defense Science Board, March 2011
19. Quantitative Analysis of a wide area scan for vulnerable devices, DHS ITTC meeting, SRI, Feb 2011
20. Polymorphic Shellcode: The Demise of Signature-based Detection
 - 1 Sandia National Labs, March 2010.
 - 2 Invitation, U Cal Berkeley, Nov, 2009.
 - 3 Invitation MIT LL, June 2009.
 - 4 Invitation ORNL, June 2009.
21. Network Analytics, C3E Workshop, Invitation, Santa Fe, July 2009
22. Advanced research in IDS, MITRE, June 2009..
23. Insider Attack Detection, InfoSec, ACNS, CA, 2008.
24. I3P Insider Attack Project Review, 2007.
25. Payload-based Anomaly Detection, IBM/CU/Stevens Security Day, 2007.
26. Insider Threat research I3P Meeting, GA Tech, , December 2006.
27. DNI/DTO Invitation only Workshop, New Research on Privacy-preserving data mining, December 2006.
28. DARPA ISAT Meeting on Advanced Machine Learning Research, August 2006.
29. DARPA Advanced IDS Meeting, Overview of research on advanced IDS, Feb 2007.
30. DNI/DTO PI Meeting, Large-Scale System Defense, March 2007.
31. ARO PI meeting, Masquerader Detection. August 2006
32. Invited talk, Collaborative Security, Global Security Consortium, Washington, DC, Oct 2005.
33. Invited talk, Advanced Stealthy Malware attacks, ARO Malware Workshop, Washington, DC, August 2005.
34. Invited talks on "Behavior-based Computer Security" (2003-2005),
35. Adversarial Learning in Computer Security, NIPS Workshop, 2007.
 1. ISMIS 2005, Saratoga Springs, NY, Keynote talk.
 2. Federal Aviation Administration,
 3. DARPA IRC Meeting, Hard Technical Problems,
 4. IEEE ICDM-2003, Int. Workshop on Data Mining for Security Applications
 5. Griffiss Institute Conference, November, 2003,
 6. International Workshop on Mathematical Methods, Models and Architectures for Computer Networks Security", St. Petersburg, Russia, September 2003,
 7. Government Convention on Emerging Technologies, Defending America Together: The New Era, Las Vegas, Jan, 2003,
 8. NIST ACIT Workshop on Insider Threat, Feb 2003,
 9. Griffiss Institute Meeting on Information Assurance and Cyber Security, Utica, Feb 2003,
 10. Polytechnic University, May 2003,
 11. Workshop on Machine Learning in Computer Intrusion Detection, GMU, Sept 2003.
36. Invited talks and briefings on Data Mining Based Intrusion Detection, 2002-2003,
 1. EDS, Lockheed Martin, CACI, White House, DoD (PACOM, AFCERT), NSA, CIA, OSD, DISA, CISCO, Symantec

37. Invited State of the Field Talk, Data Mining, Supercomputing 2000.
38. Invited lecture, The JAM Project and Intrusion Detection, IBM Yorktown Heights, May, 1999.
39. Invited participant, White House/DOE Invitational Workshop on Detection of Malicious code, Intrusions, and Anomalous Activity Workshop, Washington, February, 1999.
40. Keynote Speaker, Advance Information Technologies for Government Conference, Washington D.C., September, 1998.
41. Panelist, KDD98, Distributed Data Mining Workshop, August, 1998.
42. Invited Lecture, The JAM Project, Java Agents for Meta-Learning
 1. NISS Workshop on Security and Privacy of Statistical Information, Washington, D.C., September, 1997
 2. Classification Society of North America Conference, CSNA-97, June 1996.
43. Fraud and Intrusion Detection
 1. Panelist, Computer Misuse and Anomaly Detection Workshop, Monterey CA, November 1996
 2. Panelist, SPIE 1996, Boston, November 1996
 3. DARPA ITO IDS meeting, Rome Labs, Boston, November 1996
 4. DARPA ITO IDS meeting, Santa Cruz, CA, September 1996
44. Invited Lecture, Parallel and Distributed Database Inference and Applications, MIT AI Lab, February, 1996
45. Parallel and Distributed Database Inference and Applications, IBM, Hawthorne, NY, December 18, 1995
46. Merge/Purge for Large Data Bases
 1. Polytechnic University CATT, Corporate Research Review, December 12, 1995
 2. Citicorp, CTO, October 1995.
47. Scalable Data Mining, NYU Stern Business School, November, 1995.
48. Learning Arbiter and Combiner Trees From Partitioned Data, First Int. Conf. on Knowledge Discovery in Databases, August 1995, Montreal, Canada.
49. Parallel and Distributed Database Inference, Polytechnic University CATT Forum, March, 1995.
50. Scalable Active Databases, Schloss Dagstuhl, Internationales Begegnungs-Und Forschungszentrum Fur Informatik, March 1994.
51. Parallel Production System Languages, Workshop on Innovative Applications of Production Systems, IJCAI Conference, Chambéry, France, August 1993.
52. Parallel processing of Merge/Purge, Axiom Corporation, March 1993.
53. Scalable Machine Learning by Meta-learning, First DARPA Workshop on Intelligent Information Integration Systems, March, 1993.
54. Integrating Large Data and Knowledge Bases, NSF Workshop on HPCC and AI, February 1992.
55. Is Production System Matching Interesting, Panel Discussion and Presentation, Tools for AI Conference, Washington, D.C., November, 1992, pp. 2-3.
56. The PARULEL Parallel Rule Language, International Conference on Parallel Processing, Illinois, August 1991.
57. Research At Columbia's Center for Advanced Technology, Long Island Forum for Technology, 1990.
58. Speech Recognition in Parallel
 1. Univ. of Connecticut, November 1989.

2. DARPA workshop on Speech and Natural Language Processing, October 1989.
59. Testimony on FCCSET and SIAM reports on the National Supercomputing Initiative, Office of Science and Technology Policy, Rayburn Building, Washington D.C., February, 1988.
60. Let's Stop the Dust from Collecting on OPS5, IFIP WG10.1 Workshop on Concepts and Characteristics of Knowledge-based systems, Mt. Fuji, Japan, November 1988.
61. On the Limitations of (SIMD) Massively Parallel Computers for Logic Programming, First NSF/ICOT Workshop on Artificial Intelligence, November 1988.
62. The DADO Machine and its Application, MIT Lincoln Laboratories, November 1986, RCA Laboratories, NJ, May, 1985, Asilomar Microcomputer Workshop, Monterey, CA, 1985, MCC, Austin TX, November, 1984
63. Five Parallel Algorithms for Production Systems, New York University, Ultra-computer Project seminar, 1985.
64. Parallelism in New Generation Computing, invited panelist, 1984 International Conference on Fifth Generation Computing, Tokyo, Japan, November, 1984.
65. Expert Systems and AI, Long Island ACM Chapter Meeting, NY, May 1984.
66. Knowledge Engineering: Theory and Practice
 1. National Defense Science Board, December 1983
 2. LIFT Business Organization, October 1983
 3. Intel Corporation, October 1983
 4. Honeywell Corporation, October 1983
 5. Naval Research Laboratory, September 1983
 6. ONR Contractor's Meeting, September 1983, Carnegie-Mellon University, September 1983
 7. IBM/Columbia Technical Symposium, White Plains, NY, March 8, 1983
67. NON-VON and DADO: Two Parallel Architectures, Seminar in AI, Rutgers University, NJ, April 15, 1983.
68. AI Research at Columbia University, Brooklyn College, City University of New York, NY, March 5, 1983.
69. Expert Systems
 1. AIL Division, Eaton Corporation, NY, March 4, 1983,
 2. Grumman Corporation, NY, 1982,
 3. Office of Naval Research/National Bureau of Standards Workshop on Automated Manufacturing Research, Gaithersburg, MD, 1982.
70. An Overview of the DADO Project
 1. IBM/Columbia Technical Symposium, White Plains, NY, March 7, 1983
 2. Digital Equipment Corporation, MA, February 25, 1983
 3. Workshop on Parallel Architectures, Sponsored by Lawrence Livermore Laboratories, Boulder, CO, January 20, 1983
 4. Parallel Processing Workshop, New York University, NY, April 1982
71. Advanced Architectures, Invitational panel session at the Third International Conference on Distributed Computing Systems, Miami, FL, October 20, 1982.

Research Contracts and Grants

(Total for which formal records exist since 1982: over \$50,500,000, average over \$1,200K/year)

- 1 Columbia DSI, Mastercard sponsored Digital Identity Project, \$1MM over 3 years.

- 2 IARPA SCITE, Insider Threat Research, \$1M, 2016-2018.
- 3 ONR Buddy: TCB Hardening for Cyber Physical Systems, \$2.5MM over 3 years.
- 4 DARPA Active Authentication, Phase 2, Active Authentication: Search Behavior and Decoy Technology, Allure Security Technology, Inc., \$2.1 M, 2013-2015.
- 5 DARPA SBIR, Automatic Repair of Vulnerable Firmware, Red Balloon Security, \$100K, 2013.
- 6 DARPA Cyber Fast Track, SBIR, Red Balloon Security, (A Columbia spinout), \$273K, 2013.
- 7 DARPA Cyber Fast Track, SBIR, Red Balloon Security, (A Columbia spinout), \$150K, 2012.
- 8 DHS Advanced Situation Awareness of High Impact Attacks against the routing infrastructure, \$720K, 2012-2013.
- 9 DARPA CRASH, incremental funding for research staff, (joint with Simha), \$450K, 2012-2013.
- 10 AFOSR Designing for Measurable Security, \$1,890K, 2011-2017
- 11 DARPA MRC, MEERKATS Project, \$6,500K, 2011-2014.
- 12 DARPA Active Authentication Program, Allure Security Technology (A Columbia spinout), \$500K, 2012.
- 13 DARPA SBIR, Allure Security Technology (A Columbia spinout), Phase 2, \$1,500K, 2011.
- 14 DARPA SBIR, Allure Security Technology (A Columbia spinout), Phase 1, \$150K, 2011.
- 15 DARPA ADAMS – Advanced Behavioral Sensors, (w/ A. Keromytis) \$780K, 2011-2013.
- 16 DARPA CRASH/SPARCHS, joint with several faculty and Princeton, \$6.4M, 2010-2013.
- 17 IARPA STONESOUP Program, MINESTRONE, joint with several faculty, \$500K, 2010-2013.
- 18 NSF EAGER, Measuring the Security Posture of Large Financial Organizations, the Human Factor, NSF, \$300K, 2009.
- 19 AFOSR DURIP Equipment Grant, \$650K, 2009.
- 20 Botnet Threat, ONR Joint with Yale, \$295K, 2009.
- 21 DHS S&T, Privatized Network Traces (joint with BAE), 2008-2009, Phase 1: \$500K, Total \$2,000,000.
- 22 Symantec Gift, \$32.5K, 2009.
- 23 IARPA, Secure Private Querying, \$600K (shared by 4 PI's), 2008.
- 24 DARPA National CyberRange, Phase 1, (joint with BAE), 2009, \$70K.
- 25 DARPA, Automatically Parallelizing Legacy Binary Code for Multi-Core Architectures via Extraction of Self-Similarity, \$85K, June 2008-May 2009.
- 26 ARO/NSA, Distributed Network Anomaly Detection and Insider Threats, \$412K, Jan 2006 – Dec 2009.412,0
- 27 NSF CyberTrust, CT-T: Enabling Collaborative Self-healing Software systems, \$808K, Sept 2006 – Aug 2009.
- 28 AFRL MURI joint with GMU, \$1.3 million over 5 years.
- 29 DHS/I3P Insider Threat Project, \$600K over 18 months, 2007-2008.
- 30 Google research grant, 2007 \$25K, 2008 25K.
- 31 NYSTAR CAT, Social Network and Document Flow Analysis, NYSTAR CAT, \$20K, Jun – Dec 2006.
- 32 DTO (NSA, formerly ARDA), Large-Scale System Defense, DTO, \$500K, 18 months.
- 33 DARPA, Model Exchange for Access Control in MANETS, \$200K, 2006-2007.
- 34 NIST/ARO, BARTER: Model Exchange for Access Control and Security in Mobile Ad Hoc Networks, \$25K, Jan 2006 – Dec 2006.
- 35 NSA, Phase 2 Distributed Network Anomaly Detection, \$200K, Jan 2006 – Dec 2006.
- 36 ARDA Malware Challenge Problem, Detecting Data-driven malware, \$74K, Jan 2006-Aug 2006.

- 37 ARO, Insider Attack Detection, \$200K, Jan 2007 – Dec 2008.
- 38 ARO Grant, Stealth and Counter-Evasion Techniques, \$50K, Oct 2005 – Sept 2006.
- 39 NSF DG Email Mining for Supporting Forensics for Law Enforcement, Sep 2005-Sep 2006, \$100K.
- 40 Collaborative Security, DHS/ARO, \$136K, October 2004-October 2005.
- 41 DHS SBIR Grant, Cross Domain Collaborative Security, DHS, \$33K, Oct 2004-Oct 2005.
- 42 DHS SBIR Grant, Malicious Code Detection, DHS, \$33K, Oct 2004-Oct 2005.
- 43 ARDA/PNL, Malware Challenge Problem, \$10K, May 2005.
- 44 NSF Workshop on Resilient Financial Information Systems, \$25K, May 2005 – April 2006.
- 45 NSF DG Email Mining for Supporting Forensics for Law Enforcement, Sep 2004-Sep 2005, \$100K.
- 46 Maryland Procurement Office, Dept. of Interior, Distributed Intrusion Detection Feasibility Study, \$300K, April 2003 – March 2004.
- 47 DARPA Cyber Panel Grant, Application Level IDS, \$300,000, Sept 2002-Sept 2003.
- 48 In-Q-Tel, Email Mining Toolkit, \$74,000, Jan 2003.
- 49 NSF SGER joint with Columbia Business School, \$100,000, 2001-2002.
- 50 DARPA Grant with NFR, Incremental Update of IDS, \$200,000, 2001-2002.
- 51 ITT Grant for research on Correlation in Intrusion Detection Systems, \$100,000, 2000.
- 52 DARPA Grant, Cost-sensitive Modeling for Intrusion Detection, joint with NCSU and FIT, \$900,000, 3 years, 2000-2002.
- 53 DARPA STTR Grant, Phase I, with NFR Corporation, \$35,000, 2000.
- 54 DARPA STTR Grant, Phase I, with RST Corporation, \$38,000, 2000.
- 55 NSF Digital Government Program, The CARDGIS Energy Data Collection, joint with USC/ISI, \$1,500,000 for 3 years.
- 56 NSF CISE Infrastructure Grant to Department of Computer Science, \$42,000 in first year, 1996-2000.
- 57 Scalable Data Mining by Meta-Learning, NSF Data Base and Expert Systems and Knowledge and Cognitive Modeling Programs, \$153,000 for 3 years, Starting July 1996.
- 58 Fraud and Intrusion Detection for Financial Information Systems, ARPA Grant, BAA96-03, Survivable Information Systems, joint with FIT, \$1,000,028 for 3 years, 1996-1999.
- 59 Scalable Data Mining by Meta-Learning Agents, Polytechnic University CATT, \$60,000, July 1996- June 1997.
- 60 Parallel and Distributed Intelligent Systems, Polytechnic University CATT, \$55,000, 1995-1996.
- 61 Scalable Parallel and Distributed Expert Database Systems, NSF, \$80,000, IRI 93-13847, 1994-1995.
- 62 Scalable Parallel and Distributed Pattern-directed Inference Systems for Fraud Detection, Polytechnic University CATT, \$55,000, July 1, 1994-June 30, 1995.
- 63 Citicorp CTO, Parallel Database Inference Processing, \$25,200 PhD Stipend, 1993 - 1994, \$43,200 1994-1995.
- 64 GTE Labs, \$14,000 for GRA stipend (Philip Chan), Summer 1992.
- 65 D.E. Shaw & Co., \$5,000, Donation to CS/CAT Industrial Affiliates, 1992.
- 66 Citicorp CTO, \$36,000 for network services and consulting, 1992, 1993, 1994, 1995.
- 67 Donation of DEC station 5000, Digital Equipment Corporation, October 1990, \$99,600.
- 68 Citicorp NAIB support for joint expert system research project through Columbia Center for Advanced Technology 1989, \$50,000.

- 69 Donation in support of DADO4 development, static memory chips, IDT Corporation, 1989, \$30,000.
- 70 Defense Advanced Research Projects Agency, Research in Parallel Processing, November 1987-June 1989, \$554,000.
- 71 Defense Advanced Research Projects Agency, Strategic Computing Program support for the DADO Project. (1985: \$560,000)
- 72 Valid Logic Systems, donation of 2 Computer Aided Engineering workstations. (1984: \$180,000)
- 73 New York State Science and Technology Foundation, Massively Parallel Processing support as part of the Center of Advanced Technology in Computers and Information Systems. (1984: \$181,000, 1985: \$222,000, 1986: \$220,000, 1987: \$180,000, 1988: \$180,000, 1989: \$173,000, 1990: \$200,000, 1991: \$185,000, 1992: \$180,000, 1993: \$180,000).
- 74 Fifth Generation Licensing Payments for support of Research, (1987: \$44,000, 1986: \$40,000, 1985: \$14,000.).
- 75 AT&T Foundation, Research in Speech Generation (Nathaniel Polish), 1986: \$25,000.
- 76 The DADO Project, Defense Advanced Research Projects Agency. (1984: \$560,000)
- 77 Specialized Architectures for Production Systems, Defense Advanced Research Projects Agency. (1982-1983: \$512,000)
- 78 Learning Problem Solving Strategies in Knowledge Engineering, Office of Naval Research, 1982-1985. (1982-1984: \$240,000)
- 79 IBM Corporation, donation of hardware components for the DADO Project as well as stipend monies for two of my Ph.D. students. (1983-1984: \$20,000)
- 80 Intel Corporation, donation of hardware and components for the DADO Project. (1982: \$30,000)
- 81 IBM Faculty Development Award. (1984-1985: \$60,000)
- 82 Hewlett-Packard Corporation, 8 Computer Workstations, (1984: \$676,000).

Ph.D. Students

1. Daniel Miranker, completion October 1986: "Treat: A New and Efficient Match Algorithm for Production System", Associate Professor with tenure University of Texas at Austin.
2. Stephen Taylor, left program in 1985 with MS to complete PhD at Technion, Professor at Dartmouth.
3. Alexander Pasik: "More Parallelism in Production Systems", completion May, 1989, Vice President, Gartner Group.
4. Michael van Biema: "The Constraint-based Programming Paradigm", completion November 1989, Associate Professor Columbia University.
5. Russell Mills: The llc Parallel Programming Language, Ph.D. awarded posthumously, 1992.
6. Nathaniel Polish: Knowledge-based Speech Generation, completed January, 1993, President NPS Associates.
7. Hasanat Dewan: Paradiser Project, Predictive Dynamic Load Balancing, completion May 1994, VP of R&D, Deutschebank.
8. Jason Glazier: Dynamic Neighborhood Variance Reduction for Monte Carlo Simulations, September 1994. Vice President Morgan Stanley.
9. David Espinosa: Semantic Lego: Formal specification of programming language interpreters, March 1995, Member Technical Staff of Kestrel Institute.

10. Mauricio Hernandez: The Merge/Purge Problem as a Generalization of Band Joins, March 1996, Assistant Professorship, University of Illinois, Springfield.
11. Philip Chan: Distributed and Parallel Meta-learning, October 1996, Associate Professor, Florida Institute of Technology.
12. David Ohsie: Event Correlation in Network Management, May 1998, Member of Technical Staff, System Management Arts, Inc.
13. Andreas Prodomidis: Strategies for Combining Multiple Classifiers, May 1999, Director of R&D, Greek National Bank.
14. Wenke Lee: Data Mining Approaches to Intrusion Detection, May 1999, Asst. Professor Georgia Tech.
15. Wei Fan: Conflict resolution of multiple classifiers, December 2000, Member of Tech Staff IBM Research.
16. Eleazar Eskin, Sparse Sequence Analysis, Asst. Professor, UC San Diego, December 2002.
17. Shlomo Hershkop, Email Mining Toolkit, Asst. Professor, Columbia University, July 2005.
18. German Creamer, Applied Machine Learning to Financial Information, Expected June 2006
19. Ke Wang. Content-based Payload Anomaly Detection. August 2006, Google CA.
20. Janak Parekh (co-advised with Kaiser), February 2007, Google NY.
21. Wei-Jen Li, Insider Detection of Malware bearing documents. June 2008.
22. Vanessa Frias-Martinez, Behavior-based Access Control, October 2008.
23. Gabriella Cretu, Towards Fully Automated Anomaly Detection Sensors, September 2009.
24. Brian Bowen, Decoy Network Traffic, Dec 2010.
25. Malek Ben Salem, User command intent modeling for Masquerade Detection, Expected Dec 2010.
26. Yingbo Song, Generating Private Traces, January 2012.
27. Ang Cui, Symbiote Technology to secure embedded devices, 2015.
28. Nathaniel Boggs, Measurement of defense in depth architectures, 2015.
29. Jill Jermyn, Discovering Network Control Vulnerabilities, May 2017.
30. Adrian Tang, Security Engineering of Hardware-Software Interfaces, April 2018.
31. Yuan Kang, Combining Programs to Enhance Security Software, April 2018.
32. Preetam Dutta, Machine Learning Based User Modeling for Enterprise Security and Privacy Risk Mitigation, April 2019.
33. Vincent Mutolo, Cybersecurity for Quantum Computing.
34. Sarah Mundy, Security architecture for Streetscape.

Master's Students

Supervised dozens of Master's Projects in Knowledge Engineering, Parallel Processing, Distributed Machine Learning.

University Service

- GS undergraduate advisor, 2024-present.
- Advisor Office of General Counsel, 2015-2016.
- CS Department Retreat, Subgroup leader on Large-Scale Parallelism, 2008.
- Columbia College Core Curriculum Committee on Science Instruction, 2006-2007.
- Homeland Security committee with Provost Cole, Apr 2003.

- Chair, CS Faculty Recruiting Committee, 1997-1998.
- Organizer, Joint meeting with USC/ISI on the Digital Government Initiative, 1998.
- Academic Committee, 1995-1996.
- NSF CISE Infrastructure Grant Committee, 1996.
- Acting Chairman, Computer Science Department, Columbia University, November 1986 - June 1987. Duties include: Management of Departmental budget, including the successful resolution of a major financial deficit position. All department administrative matters. Faculty development and promotion cases.
- Director, Center for Advanced Technology in Computers and Information Systems, 1988 - 1990. Duties include: Management and responsibility for \$2 million yearly budget.
- Regular meetings in Albany, Syracuse and Manhattan to perform duties. These include lobbying meetings called by the Foundation, and engagements with prospective industrial sponsors.
- Presented awards at the New York Academy of Sciences for the New York City finalists in the Westinghouse Young Scientists Competition.
- Evaluated several New York companies for the NYSSTF who applied for funding under various programs.
- Information Systems Subcommittee to the University Committee on Budget and Planning, 1990-1992, 1993-1994.
- Software Policy Committee, 1991.
- Chairman Search Committee, October 1986.
- Representative to GS Division Committee on Instruction.
- Liaison, New York City Partnership University/Industry Joint Pilot Project, 1989 - present.
- Speaker, numerous Computer Science Department sponsored meetings with industrial representatives of IBM, AT&T, Sperry, DEC, Aetna, Exxon, GE and GM.
- SEAS Faculty Contact Program.
- IBM Proposal Committee.
- Department Central Facilities Committee.
- Ph.D. Assignment Committee.
- DEC External Research Grant Proposal Committee.
- New York State Science and Technology Foundation Center for Advanced Technology Proposal Committee.
- Defense Advanced Research Project Agency Equipment Proposal Committee.
- Defense Advanced Research Projects Agency Proposal Committee.
- Chairman, Computer Science Department Colloquia Series.
- AI Ph.D. Qualifying Examination Committee.
- Computer Science Undergraduate Curriculum Committee.
- Barnard College Committee on Instruction.
- Liaison, Bell Labs One Year On Campus Program.
- Advisor, Barnard College Computer Science Majors.
- Advisor, Columbia College Computer Science Majors.
- Advisor, General Studies Computer Science Majors.
- Advisor, Computer Science Master's students.

Teaching Evaluations at Columbia

Consistently excellent student evaluations for entire time at Columbia; ranked the 3rd or 4th best teacher of a faculty of 20 members in the earliest days of the department. Primary course taught CSW4701, Artificial Intelligence, consistently one of the largest total enrollments, averaging over 41 students per semester. Advanced Intelligent Systems (former Knowledge-based Expert Systems). Intrusion and Anomaly Detection Systems, an elective in the MS Security track.

Courses Taught at Columbia

- CSW6185 Intrusion and Anomaly Detection Systems, Fall 2019, Fall 2018 Fall 2004, enrollment 19, Fall 2005 Enrollment 31, Fall 2006 Enrollment 21, Fall 2008 Enrollment 35, Fall 2009 50, Fall 2010, 12.
- CSW4701: Artificial Intelligence, Fall 1990 semester, enrollment 65; Spring 1993 semester, enrollment 58; Fall 1993 semester, enrollment 30; Spring 1994 semester, enrollment 40; Fall 1994 semester, enrollment 32; Spring 1995 semester, enrollment 64; Fall 1995 semester, enrollment 61; Spring 1996, enrollment 53, Spring 2002, enrollment 36, Fall 2002, 66 + 6 CVN; Fall 2003, enrollment 70 + 5 CVN; Spring 2006 Enrollment 62, Spring 2007, Enrollment 52, Spring 2009 70, Spring 2010 48, Spring 2011 56.
- CSW1001: Introduction to Programming. Sections ranged from 30 to 300 students.
- CSW3131: Data Structures. Sections ranged from 50 to 100 students.
- CSW3232: Fundamental Algorithms. 40 students.
- CSW4721: Knowledge-Based Expert Systems. Sections ranged from 8 to 15, to most recently 104 students.
- CSW6721: Knowledge-Based Expert Systems advanced level. 10 students.

Courses Taught at Bell Laboratories

Artificial Intelligence
Compiler Construction

Courses Taught at New York University

Assembler Language Programming
Introduction to Programming

Courses Taught at CUNY Brooklyn College

Programming Languages and Translators
Artificial Intelligence
Data Structures
Introduction to Programming

Professional Societies

American Association for Artificial Intelligence
IEEE
Association of Computing Machinery (ACM)
Special Interest Group on Management of Data (SIGMOD)

Special Interest Group on Artificial Intelligence (SIGART)
Special Interest Group on Computer Architecture (SIGARCH)
New York Academy of Sciences (past)
Sigma Xi Society (past)

Advisory Boards

Advisory Board of the Electrical and Computer Engineering Department of University of Puerto Rico, NSF CISE Grant oversight, 1995-1997.
Scientific Advisory Board, Center for Advanced Technology, Polytechnic University, 1990-1991.
Accreditation Committee, Department of Higher Education, State of Connecticut, 1979.
External thesis reviewer, University of Waterloo, Waterloo, Canada 1989.
External thesis reviewer, University of Melbourne, Australia, 1982.

Service to the Community

Community communications committee for the Ridgewood Council, Village of Ridgewood, Ridgewood, New Jersey, 2000.

Member of Electronic Village committee for the Ridgewood Board of Education, Ridgewood, New Jersey, 1998.

Member of and fund raiser for the Association for Retarded Citizens.

Vice President of the Board of Directors (non-budgetary) of the NJ Association for Retarded Citizens, Bergen/Passaic Unit, 1985.

Member, Special Services Advisory Council to the Board of Education, Ridgewood, New Jersey, 1997-1998.