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## Academic Appointments

**Virginia Polytechnic Institute and State University (Virginia Tech), Arlington, VA, Research Professor NextG Security and Research Director, Commonwealth Cyber Initiative (2022-present)**

Additional affiliations: *Courtesy Research Professor of Public and International Affairs; Affiliate Faculty, Computer Science; Affiliated Faculty, National Security Institute; Affiliated Faculty, Wireless@VT.* Direct the research investments of a \$50M+/year, 40+ institution program to accelerate cybersecurity research, education, new company establishment, and transfer to practice. Research areas: cybersecurity, distributed computing including DLT, information sharing, systems economics and risk, policy, and network governance. Applications include communications for underserved communities; application of communications technologies to enable elders and those with differential abilities to be independent and self-sovereign; communications and predictive technologies to address suicide prevention; and technologies to give voice to at-risk communities.

Provide leadership for the **Next G Alliance** as its **Technical Program Director**, an industry initiative led by ATIS to define and execute on a national program for leadership in wireless technology. This initiative has ~100 companies, academic institutions, and government agencies working together to provide a vision for 6G and Beyond, with the goal of restoring North American leadership in wireless technology, especially through leadership in ITU, 3GPP, IEEE, and IETF standardization.

**Georgetown University, Washington, DC, Research Professor of Computer Science (2011-2022)**

Additional affiliations with the School of Foreign Service's *Science, Technology, and International Affairs* program and the School of Continuing Studies. Co-PI of the NSF Cyber SMART Research Center at Georgetown, the follow-on to the Security and Software Engineering Research Center (S<sup>2</sup>ERC) at Georgetown, where I was Founder and Director. This Center draws funding from companies that had never supported research at Georgetown (*see funding, below*). Responsible for P&L, membership recruitment (sales and marketing), operations, and running the technical program (product delivery). No startup funds or other institutional support. Won NSF support as an Industry/University Cooperative Research Center. At my height, I contributed 2.5% of Main Campus research volume – close to 10x the productivity of Georgetown full-time faculty. Impact included a \$30,000 research project that directly led to the savings of at least \$2B for the American people.

Providing leadership for the Next G Alliance as its **Technical Program Director**, an industry initiative led by ATIS to define and execute on a national research program for leadership in wireless technology.

Developed and shepherded the Master of Science in Analytics (Big Data) program for the Provost through adoption by the Graduate School. Program exceeded matriculation and revenue projections. Taught and developed curricula for FinTech and Blockchain (FINC 258), Blockchain Technologies Management (XBUS 990), Information Warfare (COSC 411), Operating Systems (COSC 374), Cybersecurity Seminar (COSC 437), Advanced Networking (COSC 525), and Network Security (COSC 535).

Report to the SVP Research and Chief Technology Officer of the University.

**George Mason University, Fairfax, VA, Adjunct Assistant Professor of Computer Science (2000)**

Taught Data Base and Object Oriented Concepts (CS 450).

**The George Washington University, Washington, DC, Lecturer, Information Systems (1993-2000)**

Taught Software Quality Assurance (CWIS 704), Relational Data Base Theory (CWIS 702), Software Engineering (IS 703), Cooperative Application Development, Programming (C). Wrote and published two textbooks for the program.

**Illinois Institute of Technology, Chicago, IL, College of Computing Advisory Board (2022-present)**

The College of Computing develops the talent, tools, and technology to fuel a growing tech industry in Chicago and beyond by educating a workforce sophisticated in cutting-edge fields of computer science, applied mathematics, and information and industrial technologies. Our breadth gives us expertise and instruction from the very foundational ideas in computing to the very practical as well as industrial applications. Our renowned faculty are creating new boundaries in these fields through world-class

research and education, offering both undergraduate and graduate students opportunities to play a role in discovering significant breakthroughs and solving real-world problems.

**Medgar Evers College, The City University of New York**, Brooklyn, NY, **Industry Advisory Council** (2015-present)

Medgar Evers College is a senior college of CUNY and is a designated HBCU. Advise the Dean of the School of Business on the curriculum, student outcomes, strategic objectives, and initiatives in a challenging fiscal and student environment. Improved faculty retention and extramural funding by applying my experience in the commercial world to the academic environment.

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## Education

Ph.D. Computer Science, **Illinois Institute of Technology**, Chicago, IL (2006)

Graduated with Highest Honors (4.0/4.0 GPA). Recipient *IIT Exemplary Research Award*. Thesis generated two journal papers, three patents, and a book. Research topics: high-performance, real-time network protocols, high-performance Internet infrastructure, and distributed systems.

Thesis: *Ubiquitous Remote Control of Household Devices*.

Thesis Advisor: Ophir Frieder

M.B.A. International Business Management, **Katholieke Universiteit Leuven**, Belgium (1990)

Graduated with Honors. Dual Minor: Economics and Marketing.

Thesis: *Multi-National Transfer Pricing Policy*.

Thesis Advisor: Sylvain R. F. Plasschaert

S.B. Electrical Engineering, **Massachusetts Institute of Technology**, Cambridge, MA (1984)

Minor: Music. Recipient of a graduate research assistantship as an undergraduate in the Sub-Micron Structures Lab. Thesis: *MOS Simulation Techniques*

Thesis Advisor: Chris Terman

Academic Advisor: L. Rafael Reif

(no degree), **The Juilliard School PCD**, New York, NY (1978-1979)

Oboe & English Horn performance. Studied with Lois Wann (Juilliard), Steve Lickman (Dallas Symphony Orchestra), and Fred Cohen (New England Conservatory). Also studied conducting with James Rives Jones (Minnesota Symphony Orchestra/Southern Methodist University), Christian Tiemeyer (Dallas Symphony Orchestra), F. John Adams (Harvard University/Wellesley College)

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## Employment History

*See above for current academic employment*

**Office of Science and Technology Policy, Executive Office of the President, The White House**, Washington DC, **Assistant Director** (2019-2021)

Ran team that identified and transferred 100 MHz of 5G mid-band spectrum from Federal/DoD use to the private sector. This was the fastest transfer of spectrum ever: typical identification and transition development processes take years to decades – here I developed the model to enable a transition plan by the users and NTIA in a handful of months, overcoming what had been reticence of the incumbent users to consider any form of sharing or vacating. Wrote budget priorities for communications and cybersecurity research and development across the Federal R&D enterprise, including R&D budgets for NSF, DARPA, DOE, and NIST, among others. Expanded rural broadband funding. Worked with HHS during the initial phases of the COVID pandemic to enable doctors to use broadband for telemedicine. Brought industry to the White House to participate in roundtables to expand U.S. network equipment manufacturing and exports. Established Advanced Wireless Test Platforms sub-work group at NITRD. Participated in Committee on Foreign Investment in the United States (CFIUS) and Team Telecom proceedings. Assisted on communications supply chain policy development and execution. Led the R&D, laboratory, and standards portions of the *5G and Beyond Implementation Plan*. Reported to the US CTO and Deputy Assistant to the President.

**Federal Communications Commission, Washington DC,  
Chief Technology Officer (2017-2019), Senior Technology Advisor (2019-2021)**

Principal technology advisor to the Commission. Brought on to transition technology developed at Georgetown to remediate illegal robocalls. Besides creating the regulations to enable the industry to implement STIR/SHAKEN, as well as removing regulations inhibiting detecting and prosecuting illegal callers, accomplishments include leading the technology for 988, the suicide prevention hotline – improving outcomes for least 1,400 people per year; advanced video technology for bringing telecommunications services for the deaf and hard of hearing, reducing costs and improving experiences for the community, especially for emergency services; enhanced wireless 911 location services, including where in a large campus or tall building the victim is, saving lives and improving outcomes; cyber and supply chain security; enhanced wireless emergency alerting; counter-UAS technology; data over amateur radio; submarine cable security; Title I/II/III and the Internet; and reliability of wired, wireless, and broadband networks. As Senior Technology Advisor, address national security, cybersecurity, supply chain security, and numbering issues. Embedded in the Office of Economics & Analytics and reported directly to the Chair of the Commission.

**Independent Consultant (2008-2017, 2021-present)**

Selected engagements: CTIA, DIRECTV, MITRE, Ericsson, Cisco, Siemens Enterprise Networks, Akamai, Google, Verizon, Comcast, Intellectual Ventures

Representative projects:

- Expert witness on intellectual property disputes for both plaintiff and defense
- Implementation and measurement of wireless 911 location technologies
- Advise the financial services community on the telecommunications industry on an ongoing basis, including numbering, databases, new gTLD's, ICANN, roaming, lawful intercept, surveillance, cybersecurity, and VoIP.
- Patent strategy for startup and mid-size companies
- Regulatory strategy and advice
- Assisted the International Civil Aviation Organization in the development of their next generation, integrated secure air traffic management network architecture
- Assisted an international legacy network equipment manufacturer to determine corporate capabilities, channel capabilities, and new markets to address new products. Produce plan to refactor the business to address these markets. The client successfully transitioned into this new business direction and opportunity.
- Assisted a tier-1 North American ISP develop architecture and economic model for CDN interconnect that will dramatically reduce their transit costs while complying with current and expected FCC rules and Congressional policy. In addition, the economic model I developed became the baseline model for the industry.
- Assisted a startup in the mobile video communication space with business planning and securing financing.
- Assisted a legacy Asian network operator enter the North American mobile advertising space.
- Assisted a startup in the mobile advertising space. Developed intellectual property for the organization.
- Assisted a startup in the media rights space.
- Strategic research planning for a large network equipment manufacturer
- Technical due diligence on a hosted services provider for late-stage VC investment
- Architecture consulting on Application Servers and Media Servers, including vendor selection and contract negotiation strategy for a large private equity equipment manufacturer. Saved client three million dollars.
- Architecture and telco-grade high-availability implementation consulting for a hosted voice services application provider
- Advise investment bankers on the telecom enabling technology market

**Neustar, Inc. (NYSE:NSR), Sterling, VA, CTO and Senior Vice President (2009-2010)**

~1,000 employee, ~\$500MM/year telecommunications clearinghouse, naming & addressing database, Internet infrastructure services, and mobile services company. Established R&D program that led to Neustar Labs and formal support of university R&D programs. Dramatically improved intellectual property generation and bringing technology from lab to market. Reported to the Chairman and CEO.

**BEA Systems, Burlington, MA, Deputy CTO and VP Engineering (2007-2008)**

Initially worked to rationalize product lines. Proposed and lead the establishment of BEA's Communications Products Division. Initial positioning prior to reorganization was to try to convince customers BEA was "as good" as legacy providers. By repositioning the line as a Web-oriented product, CPD revenues increased 10x. When BEA exited to Oracle with a 50% increase in market cap during my tenure, the CPD was the surviving product line post-merger. Reported to the Corporate CTO.

**SnowShore Networks, Brooktrout Technology (NASD:BRKT), Cantata Technology, Salem, NH**  
*SnowShore* (2000-2004): **Founder and CTO**, venture-backed company (Charles River Ventures, Matrix Partners, St. Paul (Vestbridge), 3i); lead technology from three co-founders to a high of 72 local employees and 11 contractors in India. When Brooktrout acquired SnowShore, it was a top-25% outcome for the venture class of 2000, which was a very challenging period for telecommunications venture firms. Reported to the CEO. *Brooktrout* (2004-2006): **CTO**, Established and ran Advanced Development to build proofs of concept, quick customer demos, and direct research projects internally and at universities. Divided time between Cantata's major development centers in New Hampshire, Massachusetts, and California, as well as supported global offices, customers, and partners. Supported university R&D programs. Took Brooktrout private with Excel Switching to create Cantata Technology, doubling Brooktrout's market cap at exit. *Cantata* (2006-2007): **CTO**, investors included Oak Investment Partners, TowerBrook Capital Partners, Greenview Associates, and Anschutz Investment Company. Reported to the CEO.

**Centigram Communications Corporation (NASD:CGRM), The Telephone Connection, Rockville, MD (1993-2000)**

*The Telephone Connection* (1993-1998): **VP Engineering**, turned around company (private equity), growing staff 6x. Established relationships with local universities resulting in student Best Paper awards and integration of technologies into our products. Established strategic relations with vendors and customers, resulting in the award of a \$150M contract. Reported to the CEO. Exit to Centigram. *Centigram* (1998-2000): **Chief Scientist**, led Centigram's Maryland Technology Center of a 375+ employee public company. Established patent program, increasing portfolio by an order of magnitude. Directly involved with sale of company to ADC, which resulted in a nearly 3x increase in market cap and 10x of enterprise value. Reported to the Exec. VP Engineering.

**Cable & Wireless Communications, Inc., Vienna, VA, Manager, Software Development (1991-1993)** Manager and principal engineer for a high volume broadcast facsimile switch service. Managed group of 18 people. Reported to the Director of Software Development and the VP Engineering.

**MCI Telecommunications Corporation, McLean, VA, Consultant (1990-1991)**

Directed a staff of engineers for high volume real-time on-line transaction processing for MCI's Intelligent Network, creating the first effective architecture that today is known as a SoftSwitch. Directed and participated in research and development of transaction-oriented applications design for massively parallel supercomputer platform (nCube). This was a technical and commercial success. We demonstrated call processing capacity that could process more than all the global inter-exchange and international traffic for enhanced services. This resulted in a dramatic reduction in MCI's network equipment costs.

**Valid Logic Systems, Inc. (NASD:VLSI), various locations (1984-1990)**

**Sr. Software Engineer, Engineering Project Manager, Engineering Program Manager, San Jose, CA (1984-1986)** Responsible for largest release in the company's history, restoring product quality, then responsible for PC-based product line program; became 40% of shipments in first year. Worked with Stanford and Berkeley on sponsored research and technology transfer. **Member of the Technical Staff, Diest, Belgium (1986-1989)**. Established European Corporate Research Center. Delivered technology to create

500,000 lines of C code. **Sales Executive**, Eindhoven, The Netherlands (1989-1990). Responsible for a large, strategic account (largest electronics firm in Europe); landed largest order for Valid in 1989. Co-founded #1 competitor (Valid at that time was #2) – stopped all sales from their largest account for three quarters.

**Texas Instruments, Inc., Central Research Laboratory**, Dallas, TX, **Research Engineer** (1980-1984) Sub-Micron Structures; Device Modeling and Simulation; Full-Custom VLSI Design; my research group invented the Single-Chip DSP. Employed by TI prior to and concurrent with MIT.

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## Boards and Industry Forums

**Public Interest Registry**, Reston, VA, **Director** (2015-2017, 2021-present)

PIR is a multinational corporation in the communications services business. Developed strategy to grow revenues in a stagnating market. Directly involved with negotiations to significantly reduce cost of operations by 50%. Revenue grew from \$60MM to \$100MM with a most recent enterprise valuation at \$1.14B. International, diverse board. **Chair Audit & Risk Committee** (2022-), **Chair Finance & Audit Committee** (2017), **Treasurer** (2017), **Secretary** (2015-2016), Committee Member: **Finance & Investment** (2022-), **Finance & Risk** (2021-), **Compensation Committee** (2021), **Finance & Audit** (2015-2017), Resigned in 2017 due to Federal conflict of interest regulations. Re-elected in 2021 after return from Federal service.

**Foundation for Resilient Societies**, Exeter, NH, **Advisory Board** (2021-2022), **Director** (2022-present)

The Foundation for Resilient Societies is a non-profit organization engaged in scientific research and education with the goal of protecting technologically advanced societies from infrequently occurring natural and man-made disasters.

**Ocient, Inc.**, Chicago, IL, **Advisory Board** (2022-present)

Ocient delivers hyperscale data solutions for modern enterprises that derive value from analyzing trillions of data records in interactive time.

**SafetyDeed.com**, Washington, DC, **Co-Founder** (2022-present) and **Advisory Board** (2022)

SafetyDeed.com protects individuals, particularly elders, from real estate fraud with a novel solution at the intersection of law and technology.

**Revolutionary Integration Group, Inc.**, Bethany, CT, **Industry Advisory Board** (2021-2023)

AI validated trust for IoT. Reset company for new opportunities.

**Honey Badger HQ, Inc.**, Sawbridgeworth, UK, **Advisory Board** (2021-2022)

Cyber security for call centers and financial services industry

**SS8, Inc.**, San Jose, CA, **Advisory Board** (2021-2022)

SS8 is a multinational lawful intercept and intelligence collection products and services company.

**atfCYBER**, Issaquah, WA, **Chair of the Board of Directors** (2016-2019)

Cybersecurity authentication solutions for IoT. Raised seed funding. Founders ran into health issues and we decided to wind down the company.

**Dexrex LLC**, Amherst, MA, **Board of Advisors** (2008-2018)

Dexrex was a startup in the compliance, instant messaging, and social networking space. Resigned due to Federal conflict of interest rules.

**Ascension Technology Group**, Atlanta, GA, **Director** (2012-2016)

ATG was a cloud technology managed services provider. Successful exit in a private transaction.

**Internet Society**, Reston, VA, **Trustee** (2009-2015), **Chair of Audit Committee** (2014-2015), Executive Committee, Compensation Committee, Governance Committee, Nominations Committee, international, diverse board. ISOC promotes the development of the Internet. \$81MM annual budget; established \$59MM Foundation Endowment. Selected new CEO and executed transition.

**Sigma Systems**, Toronto, Canada, **Board of Advisors** (2008-2015)

OSS systems for the communications industry. Advice on technology, business, and exit strategy. Successful restructure with Birch Hill Equity Partners in 2015 leading to exit to Hansen Technologies in 2019.

**IETF Trust**, Reston, VA, **Trustee** (2010-2012)

The IETF Trust advances educational and public interest by acquiring, holding, maintaining and licensing intellectual property and other property used in connection with the Internet standards process and its administration.

**SIP Forum**, Stockholm, Sweden, **Chairman of the Board** (2007-2010), **Director** (2003-2007)

SIP Forum promotes voice over IP, anti-robocalling technology, and ubiquitous communications access. Established certification program that increased membership five-fold.

**IMS Forum**, Denver, CO, **Director** (2002-2007)

The IMS Forum advanced the state of the art in packet telephony technology and implementation. This was the successor organization to the International Packet Communications Consortium (IPCC) and the International Softswitch Consortium (ISC).

**Vivexchange.com**, Milpitas, CA, **Board of Advisors** (1999-2000)

A B2B e-commerce company; assisted with funding rounds. Sold to Commerce One. Recouped 100% of equity, a major feat at the end of 2000.

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**Issued and Published Patents**

1. Abramov, A. and Burger, E., A Hybrid Smart Watch with Multiple Sources of Time, Multiple Power Sources, and Multiple Time Indicator Mechanisms, **US 10,663,925**, 2020
2. Federoff, H., Frieder, O., and Burger, E., System and Method of Applying State of Being to Health Care Delivery, **US 10,162,940**, 2018
3. Burger, E., Pelson, J.A., Heard, D., and Traver, G.: System and Method for Correlating User Call Response to Electronic Messages, **US 9,609,145**, 2017
4. Burger, E., Pelson, J.A., Heard, D., and Traver, G.: System and Method for Correlating User Call Response to Electronic Messages, **US 9,369,591**, 2016
5. Federoff, H., Frieder, O., and Burger, E.: System and Method of Applying State of Being to Health Care Delivery, **US 9,305,140**, 2016
6. Burger, E., Pelson, J.A., Heard, D., and Traver, G.: System and Method for Correlating User Call Response to Electronic Messages, **US 9,105,057**, 2015
7. Filreis, J. and Burger, E.: Facsimile transmission authentication, **US 8,533,477**, 2013
8. Burger, E. and Frieder, O.: System and Method for Providing User Input Information to Multiple Independent, Concurrent Applications, **US 8,286,190**, 2012
9. Filreis, J. and Burger, E.: System and Method for Authentication of Transformed Documents, **US 8,219,817**, 2012
10. Burger, E. and Frieder, O.: Remote control of device by telephone or other communication devices, **US 7,885,272**, 2011
11. Burger, E. and Frieder, O.: System and Method for Providing User Input Information to Multiple Independent, Concurrent Applications, **US 7,406,696**, 2008
12. Burger, E., Hughes, J., and Penny, D.: Low Latency Packet Processor, **US 7,330,900**, 2008
13. Burger, E. and Van Dyke, J.: Universal Voice Browser Framework, **US 7,149,287**, 2006
14. Burger, E.: System and Method for Performing Signaling-Plan-Specific Call Progress Analysis, **US 7,139,380**, 2006
15. Burger, E. and Womer, M.: Cache for Large-Object Real-Time Latency Elimination, **US 6,988,169**, 2006

16. Burger, E., O'Connor, W., Spitzer, A., and Wessler, B.: Network-Based Disc Redundancy Storage System and Method, US 6,779,082, 2004
  17. Burger, E., Kimball, J., O'Connor, W., Taylor, N., Parikh, S., Pax, C.: System and Method for Locating Subscribers Using a Best Guess Location Algorithm with Enhanced Location Determination, US 6,678,366, 2004
  18. Burger, E. and Spitzer, A.: Distributed Telephony Resource Management Method, US 6,477,172, 2002
  19. Parikh, S., and Burger, E.: System and Method for Call Management with Voice Channel Conservation, US 6,408,177, 2002
  20. Nestoriak III, J. and Burger, E.: Enhanced Telephone Service System with Secure System and Method for E-Mail Address Registration, US 6,353,852, 2002
  21. Burger, E. and Kimball, J.: Voice Call Processing Methods, US 6,353,660, 2002
  22. Shankarappa, V., Burger, E., and Nestoriak, J.: Service Platform with Secure System and Method for Subscriber Profile Customization, US 6,266,690, 2001
- Other patents may be pending (not yet published by the USPTO). Other patents issued worldwide, related to the above US Patents.

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## Technical Publications and Monographs

### Refereed Journal Papers and Monographs

1. Hassan, Z., Heeren-Moon, E., Sabzehali, J., Shah, V.K., Dietrich, C., Reed, J.H., and Burger, E.W., *Spectrum Sharing of the 12 GHz Band with Two-way Terrestrial 5G Mobile Services: Motivations, Challenges, and Research Road Map*, **IEEE Communications Magazine**, <https://doi.org/10.1109/MCOM.007.2200699>, March 2023.
2. Takanashi, Y., Matsuo, S., Burger, E., Sullivan, C., Miller, J., and Sato, H., *Call for Multi-Stakeholder Communication to Establish a Governance Mechanism for the Emerging Blockchain-Based Financial Ecosystem, Part 2 of 2*, **Stanford Journal of Blockchain Law & Policy**, (3) 2, June 2020, <https://stanford-jblp.pubpub.org/pub/multistakeholder-comm-governance2> [Journal]
3. Takanashi, Y., Matsuo, S., Jacobs, J., Burger, E., Sullivan, C., Angel, J., Saito, T., Hashirisaka, T., and Sato, H., *Consideration On Better Tokenization Practices And Regulations Concerning Investor Protection*, **Journal of Financial Transformation**, Capco Institute, vol. 51, pp. 44-54, May 2020, <https://ideas.repec.org/a/ris/jofitr/1650.html> [Journal]
4. Takanashi, Y., Matsuo, S., Burger, E., Sullivan, C., Miller, J., and Sato, H., *Call for Multi-Stakeholder Communication to Establish a Governance Mechanism for the Emerging Blockchain-Based Financial Ecosystem, Part 1 of 2*, **Stanford Journal of Blockchain Law & Policy**, (3) 1, January 2020, <https://stanford-jblp.pubpub.org/pub/multistakeholder-comm-governance> [Journal]
5. Sullivan, C. and Burger, E., Chapter *Blockchain, Digital Identity, E-government in Business Transformation through Blockchain: Volume II* (Treiblmaier, H. and Beck, R. (eds.)), Springer Nature, ISBN 978-3319990576, December 2018. [Monograph]
6. Lange, R. and Burger, E., *Long-Term Market Implications of Data Breaches, Not*, **Journal of Information Privacy and Security**, (13) 4, 2017, pp. 186-206, <https://doi.org/10.1080/15536548.2017.1394070> [Journal]
7. Sullivan, C. and Burger, E., *E-residency and blockchain*, **Computer Law & Security Review: The International Journal of Technology Law and Practice**, (33) 4, 2017, pp. 470-481, <https://dx.doi.org/10.1016/j.clsr.2017.03.016> [Journal]
8. Sullivan, C. and Burger, E., *"In the public interest": The privacy implications of international business-to-business sharing of cyber-threat intelligence*, **Computer Law & Security Review: The International Journal of Technology Law and Practice**, (33) 1, 2017, pp. 14-29, <https://dx.doi.org/10.1016/j.clsr.2016.11.015> [Journal]



9. Burger, E., Frieder, O., *Efficient Residential Consumer Device Interaction with Network Services*, **IEEE Transactions on Consumer Electronics**, (53) 1, February 2007, pp. 100-107, <https://doi.org/10.1109/TCE.2007.339509> [Journal]
10. Burger, E., Frieder, O., *A Novel System for Remote Control of Household Devices Using Digital IP Phones*, **IEEE Transactions on Consumer Electronics**, (52) 2, May 2006, pp. 575-582, <https://doi.org/10.1109/TCE.2006.1649682> [Journal]
11. Chowdhury, A., Frieder, O., Burger, E., Grossman, D., and Makki, K., *Dynamic Routing System (DRS): Fault tolerance in network routing*, **Computer Networks and ISDN Systems** (31) 1-2, 1999, pp. 87-97, [https://doi.org/10.1016/S0169-7552\(98\)00232-3](https://doi.org/10.1016/S0169-7552(98)00232-3) [Journal]
12. Burger, E., *Ubiquitous Reach and Remote Control of Devices: Introducing KPML - A Protocol for Efficient Interaction with Devices*, VDM Verlag, ISBN 978-3836486460, October 2008. [Monograph]
13. Burger, E., *A New Interprovider Interconnect Technology for Multimedia Networks*, **IEEE Communications Magazine**, (43) 6, June 2005, <https://doi.org/10.1109/MCOM.2005.1452843>, pp. 147-151.
14. Burger, E.: *Program Construction in the UNIX Environment*, The George Washington University, 1994. [Textbook]
15. Burger, E.: *UNIX System Calls and Inter-Process Communication*, The George Washington University, 1994. [Textbook]

#### **Refereed Conference and Technical Magazine Papers**

16. Burger, E., Krishnaswamy, P., and Schulzrinne, H., *Measuring Broadband America: A Retrospective on Origins, Achievements, and Challenges*, **ACM SIGCOMM Computer Communication Review**, 53(2), April 2023, pp. 11-21, <https://doi.org/10.1145/3610381.3610384>.
17. Moore, T., Marshall, N., and Burger, E., *Fortuna: A Novel Staked Voting System for Distributed Pari-Mutuel Gaming*, **5<sup>th</sup> IEEE International Conference on Blockchain**, Espoo, Finland, 22 August 2022, <https://doi.org/10.1109/Blockchain55522.2022.00041>.
18. Bartholic, M., Laszka, A., Yamamoto, G., and Burger, E., *A Taxonomy of Blockchain Oracles: The Truth Depends on the Question*, **2022 IEEE International Conference on Blockchain and Cryptocurrency**, Shanghai, China, 5 May 2022, <https://doi.org/10.1109/ICBC54727.2022.9805555>.
19. McEachern, J. and Burger, E., *How to Shut Down Robocallers: The STIR/SHAKEN protocol will stop scammers from exploiting a caller ID loophole*, **IEEE Spectrum**, (56) 12, December 2019, pp. 46-52, <https://doi.org/10.1109/MSPEC.2019.8913833>.
20. Carlberg, K., Burger, E., and Jover, R., *Dynamic 5G Network Slicing for First Responders*, **IPT-Comm 2019**, Chicago, IL, USA, 15 October 2019, <https://doi.org/10.1109/IPTCOMM.2019.8921240>.
21. Chiang, M. and Burger, E., *An Affordable Solution for Authenticated Communications for Enterprise and Personal Use*, **8<sup>th</sup> IEEE Annual Computing and Communication Workshop and Conference**, Las Vegas, NV, USA, 9 January 2018, <https://doi.org/10.1109/CCWC.2018.8301725>.
22. Vaidya, T., Burger, E., Sherr, M., and Shields, C., *Where art thou, Eve? Experiences Laying Traps for Internet Eavesdroppers*, **10<sup>th</sup> USENIX Workshop on Cyber Security Experimentation and Test**, Vancouver, BC, Canada, 14 August 2017, <https://www.usenix.org/node/205858>.
23. Burger, E. and Sullivan, C., *Minerva Project on the Estonian E-Residency Initiative: Impact of Estonia's Start-Up Culture on Decisions Related to Prudence & Good Governance*, **Human Aspects of the Operational Environment**, AHFE Affiliated Conference on Cross-Cultural Decision-Making, Orlando, Florida, 29 July 2016.
24. Asgarli, E. and Burger, E., *Semantic Ontologies for Cyber Threat Sharing Standards*, **IEEE International Symposium on Technologies for Homeland Security 2016**, <https://doi.org/10.1109/THS.2016.7568896>, 10 May 2016.

25. Burger, E.W., Goodman, M.D., Kampanakis, P., Zhu, K.A., *Taxonomy Model for Cyber Threat Intelligence Information Exchange Technologies*, in **Proceedings of the 2014 ACM Workshop on Information Sharing & Collaborative Security**, ISBN 978-1-4503-3151-7, September 2014, <https://doi.org/10.1145/2663876.2663883>.
26. Burger, E.W., Federoff, H.J., Fiandaca, M.S., Frieder, O., Goharian, N., and Yates, A., *Social Media Communications Networks and Pharmacovigilance: SequelAE-2.0*, in **Proceedings of the 2013 IEEE 15th International Conference on e-Health Networking, Applications & Services**, ISBN 978-1-4673-5800-2, <https://doi.org/10.1109/HealthCom.2013.6720777>, October 2013.
27. Gurbani, V.K., Burger, E., Davids, C., and Anjali, T., *SIP CLF: A Common Log Format (CLF) for the Session Initiation Protocol (SIP)*, in **Proceedings of the Usenix Workshop on Managing Systems via Log Analysis and Machine Learning Techniques (SLAML)**, <https://www.usenix.org/conference/slaml10/sip-clf-common-log-format-clf-session-initiation-protocol-sip>, 3 October 2010.
28. Burger, E., Rajasekar, S., O'Doherty, P., Lundqvist, A., and Grönberg, T., *A Telecommunications Web Services Platform for Third Party Network Access and SOA-Based Service Delivery*, **2007 Workshop on Middleware for Next Generation Converged Networks and Applications (MNCNA '07)**, <https://doi.org/10.1145/1376878.1376888>, November 2007.
29. Burger, E., Frieder, O., *Efficient Residential Consumer Device Interaction with Network Services*, **2007 International Conference on Consumer Electronics (ICCE 2007)**, January 2007, <https://doi.org/10.1109/ICCE.2007.341390>, pp. 50-51.
30. Burger, E., Frieder, O., *A Novel System for Remote Control of Household Devices Using Digital IP Phones*, **2006 International Conference on Consumer Electronics (ICCE 2006)**, January 2006, <https://doi.org/10.1109/ICCE.2006.1598371>, pp. 183-184.
31. Burger, E., Frieder, O., *Network Traffic Reduction for Transport of User Signaling Information*, **IEEE Consumer Communications and Networking Conference (CCNC 2006)**, January 2006, <https://doi.org/10.1109/CCNC.2006.1593200>, pp. 1057-1062.
32. Burger, E., *Applications for Narrow-Band Audio Streams*, Winter 2000 VON Developers' Conference, Richardson, TX, 19 January 2000.
33. Chowdhury, A., Burger, E., Grossman, D., and Frieder, O., *DRS: A Fault Tolerant Network Routing System for Mission Critical Distributed Applications*, **Proceedings of 6th International Conference on Computer Communications and Networks**, September 1997, Las Vegas, NV, <https://doi.org/10.1109/ICCCN.1997.623298>, pp. 106-113. [Nominated for Best Paper]
34. Burger, E.: *Multinational Issues in R&D Management, Technology Management: The New International Language*, October 1991, <https://doi.org/10.1109/PICMET.1991.183607>, p. 184.
35. Burger, E.: *The Use of Unix Software Tools for Automatic Program Generation*, **Proc. 1st Sun Expo**, March 1990.
36. Burger, E. and Dedene, G.: *Economics of Point Acceleration*, **Proceedings 1st European Design Automation Conference**, February 1990, <https://dl.acm.org/doi/abs/10.5555/949970.950066>, pp. 424-428.

### **Refereed Conference Posters**

37. Klass, G. and Burger, E., *Vendor Truth Serum* (Poster), **High Confidence Software and Systems Conference**, Annapolis, MD, 8-10 May 2017.
38. Vaidya, T., Burger, E., Sherr, M., and Shields, C., *Studying the Pervasiveness of Internet Interception with Honey{POP,SMTP,Telnet}* (Poster), **USENIX Security 2015**, 12 August 2015.

My Erdős number is 3 (Ophir Frieder⇒Frank Harary⇒Paul Erdős)

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## Technical Reports

1. Burger, E., Dillon-Merrill, R., Heeren-Moon, E., and Forti, F., [\*Calculating Return on Investment in a Department of Defense Context\*](#), Defense Technical Information Center, 1 March 2022.
2. Leech, D., Ferris, S., Scott, J., *The Economic Impacts of the Advanced Encryption Standard, 1996-2017*, NIST GCR 18-017, <https://doi.org/10.6028/NIST.GCR.18-017>, September 2018 (contributor).
3. Stohrer, T., Stewart, A., and Burger, E., [\*Issues, Analysis, and Tools For Rural Call Completion Issues\*](#), 27 June 2017.
4. Lange, R. and Burger, E., [\*Market Implications of Data Breaches\*](#), 16 December 2016.
5. Klass, G. and Burger, E., [\*Vendor Truth Serum\*](#), 22 September 2016.
6. Burger, E. and Kieserman, J., [\*Next Generation Caller Identification\*](#), 23 June 2016.
7. Burger, E., [\*Issues and Analysis of a Provider Transition for the NPAC\*](#), 22 July 2014.
8. Burger, E., [\*A Taxonomy for CyberISE Technology Evaluation\*](#), 17 February 2014.
9. Burger, E., *Chairman's Summary of the First SIP Forum SIP Interoperability Workshop, SFSIW-1*, [http://www.sipforum.org/component/option,com\\_docman/task,doc\\_download/gid,150/Itemid,261/](http://www.sipforum.org/component/option,com_docman/task,doc_download/gid,150/Itemid,261/), June 2008.

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## Standards Publications

1. Burger, E. and Nagda, B., *A Session Initiation Protocol (SIP) Response Code for Rejected Calls*, RFC 8688, IETF, December 2019.
2. Gurbani, V. (Ed.), Burger, E. (Ed.), Anjali, T., Abdelnur, H., and Fester, O., *The Common Log Format (CLF) for the Session Initiation Protocol (SIP): Framework and Information Model*, RFC 6872, IETF, February 2013.
3. Holmberg, C., Blau, S., and Burger, E., *Connection Establishment for Media Anchoring (CEMA) for the Message Session Relay Protocol (MSRP)*, RFC 6714, IETF, August 2012.
4. Burger, E., *IANA Registry for MEDIACTRL Interactive Voice Response Control Package*, RFC 6623, IETF, May 2012.
5. Housley, R., Crocker, D., and Burger, E., *Reducing the Standards Track to Two Maturity Levels*, RFC 6410 (BCP 9), IETF, October 2011.
6. Holmberg, C., Burger, E., and Kaplan, H., *Session Initiation Protocol (SIP) INFO Method and Package Framework*, RFC 6086, IETF, January 2011.
7. Seedorf, J. and Burger, E., *Application-Layer Traffic Optimization (ALTO) Problem Statement*, RFC 5693, IETF, October 2009.
8. Burger, E. and Parsons, G., *LEMONADE Architecture - Supporting Open Mobile Alliance (OMA) Mobile Email (MEM) Using Internet Mail*, RFC 5442, IETF, March 2009.
9. Burger, E. and Khartabil, H., *Instant Message Disposition Notification (IMDN)*, RFC 5438, IETF, February 2009.
10. Burger, E., *WITHIN Search Extension to the IMAP Protocol*, RFC 5032, IETF, September 2007.
11. Burger, E. (Ed.), Van Dyke, J., and Spitzer, A., *Media Server Control Markup Language (MSCML) and Protocol*, RFC 5022, IETF, September 2007.
12. Burger, E. and Dolly, M., *A Session Initiation Protocol (SIP) Event Package for Key Press Stimulus (KPML)*, RFC 4730, IETF, November 2006.
13. Burger, E. (Ed.), Van Dyke, J., and Spitzer, A., *Media Server Control Markup Language (MSCML) and Protocol*, RFC 4722, IETF, October 2006.
14. Burger, E., *A Mechanism for Content Indirection in SIP Messages*, RFC 4483, IETF, April 2006.
15. Burger, E. (Ed.), Van Dyke, J., and Spitzer, A., *Basic Network Media Services with SIP*, RFC 4240, IETF, December 2005.

16. Camarillo, G., Burger, E., Schulzrinne, H., and van Wijk, A., *Transcoding Services Invocation in the Session Initiation Protocol (SIP) Using Third Party Call Control (3pcc)*, RFC 4117, IETF, June 2005.
17. Barbir, A., Burger, E., Chen, R., McHenry, S., Orman, H., and Penno, R., *Open Pluggable Edge Services (OPES) Use Cases and Deployment Scenarios*, RFC 3752, IETF, April 2004.
18. Burger, E., *Critical Content Multi-purpose Internet Mail Extensions (MIME) Parameter*, RFC 3459, IETF, January 2003.
19. Burger, E., Candell, E., Eliot, C., and Klyne, G., *Message Context for Internet Mail*, RFC 3458, IETF, January 2003.
20. *Media Server Control Using the IP Multimedia (IM) Core Network (CN) Subsystem*, 3GPP TR 24.880, June 2008.
21. RJ Auburn et al. (contributor), *Call Control Markup Language (CCXML) Version 1.0*, W3C, June 2005.
22. D. Burnett et al. (contributor), *Voice Extensible Markup Language (VoiceXML) Version 2.0*, W3C, March 2004.

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## Policy and Government Papers

1. Burger, E., *Supporting the Government, Serving the Nation*, IEEE-USA InSight, 22 June 2021, <https://insight.ieeeusa.org/articles/supporting-the-government-serving-the-nation/>
2. The White House, *National Strategy to Secure 5G Implementation Plan*, 19 January 2021, <https://www.ntia.gov/5g-implementation-plan>
3. Burger, E., comments at the FCC, in re: Rural Call Completion, WC Docket No. 13-39, 18 April 2017, at <https://www.fcc.gov/ecfs/document/104180548507226/1>
4. Burger, E., reply comments to the FCC, in re: *Petitions for Reconsideration of the Protecting the Privacy of Customers of Broadband and Other Telecommunications Services Report and Order*, WC Docket No. 16-106, at <https://ecfsapi.fcc.gov/file/103161885302540/S2ERC%20BIAS%20Reconsideration%20Reply%20Comments.pdf>
5. Sullivan, C. and Burger, E. *Estonian E-Residency and Blockchain*, **TPRC Research Conference on Communications, Information and Internet Policy 2016**, Washington DC, 29 September 2016.
6. Burger, E. and Pavur, J., reply comments to the FCC, in re: *Protecting the Privacy of Customers of Broadband and Other Telecommunications Services*, WC Docket No. 16-106, at <https://ecfsapi.fcc.gov/file/10705641704886/FCC-Encryption-Response.pdf>
7. Burger, E., Pavur, J., and Van Laan, M. comments to the FCC, in re: *Protecting the Privacy of Customers of Broadband and Other Telecommunications Services*, WC Docket No. 16-106, at <http://apps.fcc.gov/ecfs/comment/view?id=60001974396>
8. Author, *Risking It All: Unlocking the Backdoor to the Nation's Cybersecurity*, IEEE-USA, June 2014, <https://ssrn.com/abstract=2468604>
9. Author, *SOPA/PIPA Defeated... For Now*, IEEE-USA Today's Engineer, February 2011, <https://web.archive.org/web/20120328040220/http://www.todaysengineer.org/2012/Feb/SOPA.asp>
10. Lead author, *Encryption Policy*, IEEE-USA, 2008, updated 2011, <https://web.archive.org/web/20120104235302/http://ieeusa.org/policy/positions/encryptionpolicy1111.pdf>
11. CCP Chair, *FCC Spectrum Policy*, IEEE-USA Letter to Chairman Genachowski, IEEE-USA 2011, <https://web.archive.org/web/20121113101810/http://ieeusa.org/policy/policy/2011/041811.pdf>
12. Contributor, *Comments on ANPRM HHS 2011-18792: Human Subjects Research*, US-ACM and IEEE-USA 2011, <https://web.archive.org/web/20120104235302/http://ieeusa.org/volunteers/committees/ccp/documents/JointCommentswithUSACMonHumanSubjects.pdf>



13. Contributor and CCP Chair, *Network Traffic Management And The Evolving Internet*, IEEE-USA 2010, <https://web.archive.org/web/20120104235302/http://ieeusa.org/policy/positions/Network-TrafficManagementNov10.pdf>
14. Lead author, *Voice over Internet Protocol*, IEEE-USA 2010, <https://web.archive.org/web/20120104235302/http://ieeusa.org/policy/positions/VOIP.pdf>
15. Lead author, *Next Generation Internet: IPv4 Address Exhaustion, Mitigation Strategies and Implications for the U.S.*, IEEE-USA 2009, <https://web.archive.org/web/20120104235302/http://ieeusa.org/volunteers/committees/ccp/documents/IPv6FinalwhitepaperFinalAugust2009.pdf>
16. Contributor, *Why Broadband Matters*, IEEE-USA statement to US Senate Commerce, Science and Transportation Committee, 2008, <https://web.archive.org/web/20120104235302/http://ieeusa.org/policy/policy/2008/091608.pdf>

## Students

### Current

MS/PhD:

1. Thaddeus Czauski, PhD ECE (committee, Virginia Tech)

### Previous

Chair MS/PhD:

1. Tucker Moore, *Trusted Real-World Event Outcomes on A Blockchain: Staked Voting and Its Application to Distributed Gaming*, MS CS, 2021. At Microsoft.
2. Elchin Asgarli, PhD CS (ABD), 2015. First position at Google.

Committee MS/PhD:

1. Tavish Vaidya, *Exploiting and Harnessing the Processes and Differences of Speech Understanding in Humans and Machines*, PhD CS, 2019. First position at Google.
2. Hosnieh Rafiee, *Privacy and Security Issues in IPv6 Networks*, PhD CS, Hasso Plattner Institute, University of Potsdam, 2013. First position after Postdoc at HPI: Huawei.

BS:

1. Garrett Hinck, *Developing Controls on Cyber-Surveillance Exports: Civil Society's Role in Formulating Norms for Cyber Technologies*, BS STIA, 2018. First position at Carnegie Institution.
2. Katherine Schmidt, *Sovereignty in Cyberspace: How the Chinese Government Speaks about and Creates Policy in Cyberspace*, BS STIA, 2018. First position at NATO.

IEEE-USA Washington Internships for Students of Engineering (WISE):

1. McDonald, Kevin, *Network Neutrality: Public Policy Approaches for Mandating Reasonable Network Management Non-Discrimination to Preserve the Open Internet*, in WISE Journal of Engineering and Public Policy, v. 16, September 2012, [http://www.wise-intern.org/journal/2012/documents/McDonald\\_WISE\\_2012\\_Final\\_Presentation.pdf](http://www.wise-intern.org/journal/2012/documents/McDonald_WISE_2012_Final_Presentation.pdf)
2. Stinson, Preston, *An Analysis of Incentives to Encourage Adoption of the NIST Cybersecurity Framework*, in WISE Journal of Engineering and Public Policy, v. 18, September 2014, <http://www.wise-intern.org/journal/2014/documents/PrestonStinsonFinalpaper.pdf>

## Professional Affiliations, Honors, and Service

### National Science Foundation

- Review Panel: SII (CISE/ENG/HER/SBE/GEO) 2021, 2022
- Review Panel: IIP (CISE/ENG) 2017
- Review Panel: Cyber-Physical Systems (CISE/ENG/HER/SBE/GEO) 2016, 2017

**Association for Computing Machinery (ACM):** Member (1976), Senior Member (2006), Life Distinguished Member (2020)

- Member, US-ACM Intellectual Property Committee (2012-2017)
- Member, US-ACM Security and Privacy Committee (2012-2017)

- Technical Program Committees
  - ACM Middleware for Next-generation Converged Networks and Applications 2007
  - ACM Conference on Information and Knowledge Management (CIKM) 2008
  - ACM Workshop on Information Sharing and Collaboration (WISCS) 2014, 2015, 2016
  - ACM Workshop on Applying the Scientific Method to Active Cyber Defense Research (Safe-Config) 2017
- ACM Mentor
- ACM Professional Development Seminar Lecturer
  - Distributed, Scalable Application Architectures and Future Technologies (1998)

**National Academy of Inventors (NAI):** Member (2016), Senior Member (2019)

**Institute of Electrical and Electronics Engineers (IEEE):** Member (1984), Senior Member (2000)

- **IEEE Government Fellow**, FY20-21
- Recipient, **2012 IEEE-USA Professional Achievement for Individuals Award** “for sustained and collaborative support of communications technology policy.”
- Member (2016-2017), Government Fellows Committee
- Chair (2010-2011, 2022), Vice Chair (2009), Member (2005-2017, 2021-*present*) IEEE-USA Committee on Communications Policy (prior to 2008 named the IEEE-USA Committee on Communications and Information Policy)
- Member, IEEE-USA Intellectual Property Committee (2011-2017)
- Member (2010-2012, 2022), IEEE-USA Government Relations Council
- Vice Chair, New Hampshire Section of IEEE (2009)
- Executive Committee Member, New Hampshire Section of IEEE (2008-2009)
- Executive Committee Member and Chapter Liaison, Northern Virginia Section of IEEE (2000).
- Participant in the SET/IEEE Congressional Visits Day, 2000, 2005, 2007, 2008, 2015, 2022, 2023.
- General Chair
  - IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN), 2024
- Technical Program Committees
  - 41<sup>st</sup> IEEE Military Communications Conference (MILCOM), Restricted Program Co-Chair (2023)
  - 36<sup>th</sup> International Workshop on Communications Quality and Reliability (CQR), Chair TPC, 2022
  - Third Annual IEEE Cyber Resilience Economics Workshop (CRE), 2017
  - First IEEE International Conference on Smart Grid Communications (SmartGridComm) 2010
  - Principles, Systems and Applications of IP Telecommunications (IPTComm), Chair, Independent Track 2011, TPC 2013, 2014, 2015, 2018, 2021, 2022
  - Computing and Communication Workshop and Conference (CCWC), TPC 2017, 2018
- Steering Committee Member
  - IEEE International Conference on Next Generation Mobile Applications, Services And Technologies (NGMAST) 2007-2009
  - Boston Section IEEE/CS (2001-2004)
- Invited speaker for Northern Virginia Communications Society and Joint Greater Boston Area IEEE Computer Society / Greater Boston Chapter ACM
- IEEE Mentor

**National Association of Corporate Directors (NACD):** Member (2014 – 2017, 2021 – *present*)

**American Association for the Advancement of Science (AAAS):** Member and Patron (2006)

**Armed Forces Communications and Electronics Association:** Life Member (2012)

**The Internet Society (ISOC):** Member and Patron (2000)

**ISACA (former Information Systems Audit and Control Association) Member** (2014)

**OASIS:** Representative (2015 – 2019),

- Cyber Threat Intelligence Sharing Work Group
- Program Chair, Borderless Cyber Conference, 2017

**The World-Wide Web Consortium (W3C):** Advisory Committee Representative (2000-2006)

**Society for Industrial and Applied Mathematics (SIAM):** Academic Member (2003-2006)

**Association for the Advancement of Computing in Education (AACE):** Member (1999)

Technical Committees:

- **Chair**, IETF MEDIACTRL, SPEECHSC, LEMONADE Work Groups
- **Director**, IETF Applications Area Review Committee – retired
- W3C Voice Browser Work Group (VoiceXML, CCXML), Multimodal Interaction Work Group
- IEEE POSIX Standards Group (P1003)
- ITU-T SG-D

Reviewer for:

- *IEEE Transactions on Reliability*
- *IEEE Software*
- *IEEE Communications Magazine*
- *ACM Digital Threats: Research and Practice*
- *Crime, Law and Social Change Journal (Springer)*
- *International Journal of Technology Management (World Scientific)*
- *Computers & Security (Elsivier)*
- IGI Global *Future of Work* series

**Lead Mentor, MIT Venture Mentoring Service** <http://web.mit.edu/vms/>

Startups advised: using a mobile phone to collect user behavior; high-quality image processing for mobile phones; location-based services; 3D user interface devices; HVAC optimization software.

Advisor, MIT Institute Career Assistance Network <https://alumniadvisors.mit.edu>

Finalist, **CTO of the Year** (2006), Massachusetts Technology Leadership Council.

GAP International Executive Challenge Course (2000, 2012), Executive Mastery (2016-2017).

Ingenieur Designation (Professional Engineer) conferred by the Belgian Ministry of Education (1987).

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## Federal and Research Training

- High Threat Security Overseas Training
- No FEAR Act
- Whistleblower Act
- Cyber Security Awareness
- Ethics Training
- Human Research – Social & Behavioral
- Social & Behavioral Research Responsible Conduct
- Humanities Research Responsible Conduct
- Conflicts of Interest
- Export Controls

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## University Service

Member, Virginia Tech Intellectual Property Committee (2022-2025 term)

Chair, Virginia Tech CCI Search Committee (2022-2023)

Member, Virginia Tech CCI Promotion and Tenure Committee (2022-2023 term)

Member, Georgetown FT-NTL Task Force (2014)

Developed Georgetown's MS Data Science program (2014)

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## Invited Lectures, Colloquia, and Symposia

- Massachusetts Institute of Technology Sloan Business School Lecture
- Massachusetts Institute of Technology CIO Symposium
- University of Colorado Silicon Flatirons Lecture
- Georgia Institute of Technology Lecture
- University of Tokyo Institute of Industrial Science Lecture

- City University of Hong Kong Computer Science Colloquium
- Northwestern University Computer Science Colloquium
- GA Tech FutureMedia Panel
- University of New Hampshire Lecture
- Southern New Hampshire University Lecture
- George Mason University Lecture
- Invited Keynotes and Presentations to IEEE ICCE, IEEE Globecom, IEEE CQR, IEEE IPT-Comm, IEEE NGMAST, ACM MNCNA (Middleware)
- Invited Keynotes at NTIA Spectrum Policy Symposium, CTO Roundtable Summit, Silicon Flatirons Evidence Based Spectrum Policy Conference, DoE Wireless Security Workshop
- Invited Keynotes at China SIP Summit, China VoIP Forum, CommunicAsia, International SIP
- Invited Member, ITU Workshop on the Future of Voice
- Invited Member, National Science Foundation Cloud Computing Security Workshop
- Invited Member, National Science Foundation Medical Cyber Physical Systems Workshop
- Many Presentations at SIPNOC, Voice on the Net, China Softswitch Forum, SIP Summit, Connectivity Forum, IEC IN/IP World Forum and SuperComm; Multiple IEC TecForum Chair

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## Funding

### Current (Total PI: \$646,807; Total Co-PI: \$1,003,166)

- NSF, SWIFT-SAT: Efficient and On-Demand Spectrum Coexistence for Satellite-Terrestrial Systems, \$799,999, 8/23/23, Co-PI
- NSF, EAGER: Toward a Decentralized Cross-administrator Zone Management System: Policy and Technology, \$300,000, 8/23/2023, PI
- Virginia Tech Advanced Research Corporation, Next G Alliance Technical Program Office Part 2, \$346,807, 7/1/22, PI
- National Science Foundation NSF Convergence Accelerator Track G: Autonomously Tunable Waveform-Agnostic Radio Adapter for Seamless and Secure Operation of DoD Devices Through Non-Cooperative 5G Networks [ITE-2226392], \$80,000, 8/1/22, Co-PI
- National Science Foundation SWIFT: Context-Aware Spectrum Coexistence Design and Implementation in Satellite Bands (ASCENT) [CNS-2245910], \$173,167, 10/1/21, Co-PI

### Prior (Total PI: \$4,241,088; Total Co-PI: \$17,292,581)

- Transaction Network Services, Inc., Economic Impact of Branded Calling, \$28,295, 7/1/22, PI
- National Science Foundation, SWIFT: Context-Aware Spectrum Coexistence Design and Implementation in Satellite Bands (ASCENT) [CNS-2128540], \$14,332, PI
- National Science Foundation, RENEWAL: Renewing the Scholarship for Service Program at Georgetown University [NSF Award DGE-2146093], \$5,440,017, 5/24/22, Co-PI
- Comcast Corporation, NSF Cyber SMART, \$100,000, 4/1/22, PI
- NTT Research, NSF Cyber SMART, \$50,000, 4/1/22, PI
- National Science Foundation SWIFT: Context-Aware Spectrum Coexistence Design and Implementation in Satellite Bands (ASCENT) [CNS-2128540], \$14,332, 10/1/21, PI
- AIRC UARC, Calculating Return on Investment in a DoD Context, \$87,636, 9/1/21, PI
- Ripple, University Blockchain Research Initiative, \$500,000, 8/25/21, Co-PI
- National Science Foundation, IUCRC Phase I Georgetown University: Center for Science, Management, Application/s, Regulation, and Training (SMART) [IIP-2113811], \$1,000,000, 7/1/21, Co-PI
- Comcast Corporation, Cyber SMART at Georgetown, \$70,000, 7/1/21, PI
- Virginia Tech Advanced Research Corporation, Next G Alliance Technical Program Office, \$116,942, 5/24/21, PI
- The MITRE Corporation, Cyber SMART at Georgetown, \$50,000, 4/1/21, PI
- NTT Research, Cyber SMART at Georgetown, \$50,000, 4/1/21, PI



- Ontario Systems, S2ERC (via BSU)\*, \$26,172, 1/1/20, PI
- Institute for Electrical and Electronic Engineers, Government Fellowship, \$100,000, 11/1/19, PI
- Defense Advanced Research Projects Administration, Reliable Anonymous Communication Evading Censors and Repressors (RACECAR) [DARPA contract FA8750-19-C-0500], \$4,754,759, 11/27/18, Co-PI
- National Science Foundation, Foreign I/UCRC Center Site (U. Oulu/Finland)\*, \$25,000, 3/1/18, PI
- Federal Communications Commission, Interagency Personnel Act detail, \$757,861, 9/29/17, PI
- RMAAdvisors (NIST), S2ERC\*, \$5,000, 9/20/17, PI
- Farsight Security, S2ERC\*, \$5,000, 8/31/17, PI
- Comcast Corporation, S2ERC\*, \$40,000, 7/1/17, PI
- Authentic8, S2ERC\*, \$5,000, 7/1/17, PI
- Cisco Systems, S2ERC\*, \$87,118, 6/1/17, PI
- DHS (Subaward through Rutgers), Beyond Technical Solutions to Cybersecurity Risk Management and Risk Communication, \$178,242, 4/3/17, Co-PI
- National Science Foundation, Cybersecurity Fellows: The Scholarship for Service Program at Georgetown University [NSF Award DGE-1663060], \$4,999,563, 12/15/16, Co-PI
- Ontario Systems, S2ERC (via BSU)\*, \$30,040, 12/13/16, PI
- Farsight Security, S2ERC, \$5,000, 10/27/16, PI
- Sonjara, S2ERC, \$20,000, 10/20/16, PI
- DARPA, Information Fusion and Inference Tools in Medical Applications: Applying State of Being to Healthcare, \$120,000, 8/1/16, Co-PI
- AT&T, S2ERC, \$45,000, 7/12/16, PI
- Verizon, S2ERC, \$10,000, 7/8/16, PI
- Comcast Corporation, S2ERC, \$40,000, 7/1/16, PI
- NIH, S2ERC (via NSF IAA supplement), \$374,560, 6/17/16, PI
- Authentic8, S2ERC, \$5,000, 6/17/16, PI
- Minerva (OSD/ONR), Workshop: Cross-Cultural Decision Making to Advance Understanding of Human Aspects of the Operational Environment, \$9,798, 6/6/16, PI
- Minerva (OSD/ARO), MEIA Framework Supplement: Blockchains (Supplement to W911NF-15-1-0595), \$199,827, 4/29/16, PI
- AT&T, S2ERC, \$45,000, 10/14/15, PI
- Department of Homeland Security, S2ERC (via BSU), \$29,454, 10/1/15, PI
- Minerva (OSD/ARO), MEIA Framework Pilot Project (Award W911NF-15-1-0595), \$174,919, 9/3/15, PI
- Office of the Secretary of Defense (OSD), S2ERC (via NSF MIPR supplement), \$234,250, 9/1/15, PI
- DARPA, Information Fusion and Inference Tools in Medical Applications: Applying State of Being to Healthcare, \$300,000, 8/31/15, Co-PI
- Verizon, S2ERC, \$40,000, 8/1/15, PI
- Comcast Corporation, S2ERC, \$40,000, 7/1/15, PI
- Ontario Systems, S2ERC (via BSU), \$8,043, 7/1/15, PI
- Verisign, S2ERC, \$40,000, 5/27/15, PI
- iconectiv, S2ERC, \$40,000, 3/9/15, PI
- Internet Identity LLC, S2ERC, \$5,000, 2/25/15, PI
- BeulahWorks, S2ERC (via BSU), \$19,091, 2/1/15, PI
- Symantec Corporation, S2ERC, \$80,000, 1/1/15, PI
- Edgewater Networks, S2ERC, \$30,000, 7/1/14, PI
- Verisign, S2ERC, \$30,000, 7/1/14, PI

- Comcast Corporation, S2ERC, \$13,000, 7/1/14, PI
- AT&T Corporation, S2ERC, \$45,000, 5/12/14, PI
- National Science Foundation, Industry/University Cooperative Research Center: Security and Software Engineering Research Center at Georgetown University [IIP-1362046]\*, \$300,000, 4/1/14, PI
- National Science Foundation, Industry/University Cooperative Research Center: Security and Software Engineering Research Center at Georgetown University Supplements beyond MIPR/IAA funding noted elsewhere, \$90,000, 4/1/14, PI
- Internet Identity LLC, S2ERC, \$5,000, 4/1/14, PI
- iconectiv, S2ERC, \$30,000, 3/28/14, PI
- Check Point Software LLC, S2ERC, \$30,000, 3/19/14, PI
- Edgewater Networks, S2ERC, \$30,000, 3/19/14, PI
- Symantec Corporation, S2ERC @ Georgetown, \$60,000, 3/1/14, PI
- Internet Identity LLC, S2ERC @ Georgetown, \$5,000, 1/30/14, PI
- Symantec Corporation, S2ERC @ Georgetown, \$60,000, 1/1/14, PI
- Cisco Systems, S2ERC @ Georgetown, \$30,000, 7/1/13, PI
- Comcast Corporation, S2ERC @ Georgetown, \$30,000, 7/1/13, PI
- Verisign, S2ERC @ Georgetown, \$30,000, 7/1/13, PI
- Check Point Software LLC, S2ERC @ Georgetown, \$30,000, 5/24/13, PI
- Internet Identity, S2ERC @ Georgetown, \$5,000, 4/9/13, PI
- Symantec Corporation, S2ERC @ Georgetown, \$60,000, 3/19/13, PI
- AT&T, GCSC, \$50,000, 10/1/12, PI
- National Science Foundation, Planning Grant: I/UCRC for Security and Software Engineering Research Center (S2ERC) at Georgetown University [IIP-1238323], \$13,000, 9/1/12, PI
- Verisign Corporation, GCSC, \$50,000, 7/1/12, PI
- Sonus Networks, GCSC, \$33,000, 6/13/12, PI
- Edgewater Networks, GCSC, \$18,750, 2/21/12, PI
- Verisign Corporation, GCSC, \$50,000, 12/9/11, PI

\* I swapped these grants to my Co-PI while in Federal service.

**Pending (Total PI: \$1,394,284; Total Co-PI: \$14,556,503)**

- NSF, NeTS: Medium: Toward On-demand Optimal Coexistence and Resilient Spectrum Sharing for CBRS, \$ 1,200,000, 10/1/22, Co-PI
- NSF, NSF Convergence Accelerator Track G: ASTRALinQ: Autonomous, Secure, and Tunable Radio Adapter for Quantum-Safe and Covert Operation of DoD Devices Through 5G Networks, \$ 593,579, 3/31/23, Co-PI
- NSF, Integrated Community-driven Network Equity Capability Tool (I-Connect), \$ 2,500,000, 5/31/23, Co-PI
- NTIA, Neuro-symbolic AI for New Measure of Security, Risk, and Sustainability Assessment in O-RAN Operation, \$ 499,999, 6/2/23, PI
- NTIA, Integrating Novel PFP Technology into O-RAN Testing to Enhance 5G Supply Chain Risk Management, \$ 99,998, 6/2/23, PI
- NTIA, Support for Hughes Network Services for NTIA PWSCIF, \$ 5,040,111, 6/2/23, Co-PI
- NTIA, Support for Booz Allen Hamilton for NTIA PWSCIF, \$ 596,288, 6/2/23, PI
- NTIA, Support for VT-ARC for NTIA PWSCIF, \$ 5,222,813, 6/2/23, Co-PI
- AIRC, New Tech Adoption During Sustainment, \$ 73,500, 6/12/23, PI
- Cyber SMART, Subcontract to Georgetown, \$ 90,000, 9/20/23, PI
- AFWERX, Zero Trust Security in AFSOC Decentralized Wireless 5G Communications Network, \$32,999, 9/25/23, PI

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## Community Service

Treasurer, Arnon Lake Community Association (2016 – *present*)

Sunday School Teacher, Beth Chaverim Reform Congregation (2010 – 2011)

Executive Board, Congregation Betenu (2006 – 2008): Took organization from chronic deficits (the board was considering mortgaging the building to raise operating cash) to running a surplus.

Communications Infrastructure Board, Broadband Subcommittee Member, Town of Amherst, NH (~2004): Evaluated building municipal broadband internet; incumbent agreed to build out as part of franchise renegotiation.

Technology Advisor, Brookfield School (1997 – 2000)

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## Visas and Work Status

Native-born United States citizen with full right-to-work; active TS/SCI clearance

Belgian work permit of unlimited duration (Equivalent to Green Card in U.S.)

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## Personal Interests

FAA Private Pilot with Instrument Rating (Part 91); Commercial Drone Certificate (Part 107)

FCC Amateur (KN4RYL), GMRS (WPZB288), Restricted Radiotelephone Operator (RR00072904)

Tai Ji (Zheng Manqing and Yang styles) and Qi Gong (Wu Ming and Spring Forrest)

EA, FC, MM Sharon #327 VA