

**T. Charles Clancy, Ph.D.**  
**Curriculum Vitæ**

## General Information

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Hume Center for National Security and Technology  
Bradley Department of Electrical and Computer Engineering  
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## Research Interests

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I have broad experience working with digital communications and information security in the academic, business, and federal government settings. During my career, I have managed major federal research and development programs, launched startup companies, led protocol standardization efforts, and been involved in telecommunications policy and engineering in the developing world. My primary research interests are wireless networks and communication security, particularly relating to cognitive radio, next-generation wireless networks, and mobile computing. Current projects emphasize robustness and security of intelligent wireless systems.

## Education

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- Ph.D. Computer Science**, University of Maryland, College Park 2006  
Dissertation: *Dynamic Spectrum Access in Cognitive Radio Networks*  
Advisor: William A. Arbaugh
- M.S. Electrical Engineering**, University of Illinois, Urbana-Champaign 2002  
Thesis: *Analysis of FPGA-based Hyperelliptic Curve Cryptosystems*  
Advisor: Richard E. Blahut
- B.S. Computer Engineering**, Rose-Hulman Institute of Technology, *magna cum laude* 2001  
Minor: Computer Science

## Academic & Government Appointments

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- Virginia Polytechnic Institute and State University (Virginia Tech)**, Arlington, VA
- Associate Professor (with tenure)*, Electrical and Computer Engineering 2011 – present
  - Director*, Hume Center for National Security and Technology 2011 – present
  - L-3 Communications Faculty Fellow in Cybersecurity*, College of Engineering 2013 – present
  - Research Fellow*, Office of the Vice President for the National Capital Region 2010 – 2011
  - Associate Director*, Hume Center for National Security and Technology 2010 – 2011
  - Adjunct Associate Professor*, Electrical and Computer Engineering 2010 – 2011
- United States Department of Defense**
- Senior Advisor*, United States Forces – Iraq, US Embassy, Baghdad 2009 – 2010
  - Engineering Leader*, Wireless Group, Laboratory for Telecommunications Sciences 2008 – 2009
  - Senior Researcher*, Wireless Group, Laboratory for Telecommunications Sciences 2006 – 2008
  - Researcher*, Wireless Group, Laboratory for Telecommunications Sciences 2004 – 2006
  - Summer Hire*, Various Engineering/Mathematics Internship Programs 2000 – 2004

<b>University of Maryland</b> , College Park, MD	
<i>Adjunct Assistant Professor</i> , Electrical and Computer Engineering	2007 – 2010
<i>Affiliate Researcher</i> , UMD Institute for Advanced Computer Studies (UMIACS)	2003 – 2010
<i>Graduate Research Assistant</i> , Computer Science	2004 – 2005
<i>Graduate Teaching Assistant</i> , Computer Science	2003 – 2004
<b>University of Illinois</b> , Urbana-Champaign, IL	
<i>Graduate Research Assistant</i> , Electrical and Computer Engineering	2002 – 2003
<i>Graduate Teaching Assistant</i> , Electrical and Computer Engineering	2001 – 2002
<b>Indiana University/Purdue University – Indianapolis (IUPUI)</b> , Indianapolis, IN	
<i>Adjunct Instructor</i> , Office of Continuing Studies	2001 – 2003
<i>Software Engineer</i> , Community Learning Network	1998 – 2003
<b>Rose-Hulman Institute of Technology</b> , Terre Haute, IN	
<i>UNIX Systems Architect</i> , Instructional, Administrative & Information Technology	2001
<i>Systems Administrator and Webmaster</i> , Department of Mathematics	2000 – 2001
<i>Systems and Network Administrator</i> , Department of Computer Science	1998 – 2001

## Professional Activities

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### Professional Societies

<i>Member</i> , Armed Forces Communications and Electronics Association (AFCEA)	2012 – present
<i>Member</i> , IEEE Signal Processing Society	2012 – present
<i>Member</i> , IEEE Communications Society	2010 – present
<i>Senior Member</i> , Institute for Electrical and Electronics Engineers (IEEE)	2010 – present
<i>Member</i> , Wireless Innovations Forum Educational Working Group	2007 – 2010
<i>Member</i> , IEEE Communications Society	2006 – 2010
<i>Member</i> , Institute for Electrical and Electronics Engineers (IEEE)	2006 – 2010
<i>Member</i> , Association for Computing Machinery (ACM)	2006 – 2008
<i>Student Member</i> , Institute for Electrical and Electronics Engineers (IEEE)	2003 – 2006
<i>Member</i> , International Association for Cryptologic Research (IACR)	2001 – 2003
<i>Student Member</i> , Association for Computing Machinery (ACM)	1999 – 2006

### University Service

<i>Networks Area Committee</i> , ECE, Virginia Tech	2012 – present
<i>Faculty Advisor</i> , Student Cybersecurity Club, Virginia Tech	2011 – present
<i>Communications Area Committee</i> , ECE, Virginia Tech	2011 – present
<i>Network Infrastructure and Services Advisory Subcommittee</i> , VP for IT, Virginia Tech	2011 – present
<i>Scholarship Selection Committee</i> , Hume Center, Virginia Tech	2010 – present
<i>Faculty Search Committee</i> , VP for the National Capital Region, Virginia Tech	2013
<i>Area Recruiting Representative</i> , Communications Area, ECE, Virginia Tech	2012 – 2013
<i>Faculty Search Committee Chair</i> , Software Security Position, ECE, Virginia Tech	2012 – 2013
<i>Faculty Search Committee Chair</i> , Portfolio Director, Hume Center, Virginia Tech	2012
<i>Faculty Search Committee</i> , Software Security Position, ECE, Virginia Tech	2011 – 2012
<i>Review Panel Member</i> , ICTAS Joint Faculty Collaborative Program, Virginia Tech	2011
<i>Faculty Search Committee</i> , Cyber Security Position, Computer Science, Virginia Tech	2010 – 2011

**External Service**

<i>Member, Cyber Security Advisory Counsel, DHS Nat'l Cybersecurity Protection System</i>	2014 – present
<i>Star Mentor, Mach37 Cybersecurity Incubator</i>	2014 – present
<i>North America Regional Representative, IEEE SPS Information Forensics and Security</i>	2014 – present
<i>Communications Security Area Chair, IEEE SPS Information Forensics and Security</i>	2014 – present
<i>Member, Technical Directions Committee, IEEE SPS Information Forensics and Security</i>	2014 – present
<i>Vice Chair, IEEE COMSOC Cognitive Network Security Special Interest Group</i>	2013 – present
<i>Member, IEEE SPS Information Forensics and Security Technical Committee</i>	2013 – present
<i>Member, STEM Planning and Advisory Committee, Fairfax County Public Schools</i>	2013 – present
<i>Member, IEEE COMSOC Technical Committee on Cognitive Networks</i>	2013 – present
<i>Associate Editor, IEEE Transactions on Information Forensics and Security</i>	2012 – present
<i>Member, JCOTS Cyber Security Panel, Virginia General Assembly</i>	2012 – present
<i>Member, Innovation and Technology Council, AFRL ACT Program</i>	2012 – present
<i>Advisory Board, NSF Remotely Accessible Virtualized Environment (RAVE) Program</i>	2012 – present
<i>Member, IEEE COMSOC Communications and Information Security Technical Committee</i>	2011 – present
<i>Co-Director, NSF Security and Software Engineering Research Center</i>	2011 – present
<i>Program Reviewer, NSA Cyber Operations Center for Academic Excellence Program</i>	2014
<i>Member, Enduring Capabilities Working Group, Joint IED Defeat Organization (JIEDDO)</i>	2012
<i>Review Panel Member, National Science Foundation</i>	2010
<i>Steering Committee, NSF EARS Workshop</i>	2010
<i>Vice Chair, DoD IEEE 802.16 Secure Profile Working Group</i>	2009 – 2010
<i>Chair, Security Task Force, DoD IEEE 802.16 Secure Profile Working Group</i>	2009 – 2010
<i>Co-Chair, IETF Handover Keying Working Group</i>	2006 – 2009
<i>Member, IETF Security Directorate</i>	2006 – 2009
<i>Security Advisor, IETF CAPWAP Working Group</i>	2006 – 2008
<i>Security Advisor, IETF Extensible Authentication Protocol Working Group</i>	2005 – 2007
<i>Member, IEEE 802.22 Spectrum Sensing Task Force</i>	2005 – 2006

**Industry Leadership and Consulting**

<i>Co-Founder &amp; Board of Directors, Federated Wireless Inc</i>	2012 – present
<i>Co-Founder &amp; Board of Directors, Optio Labs Inc</i>	2012 – present
<i>Founder &amp; Managing Member, Stochastic Research LLC (independent consulting)</i>	2009 – present
Barr Group, Inc	2013 – 2014
Center for Innovative Technologies	2011
Chemring North America	2014
CTIA – The Wireless Association	2013 – 2014
Eogogics, Inc	2011 – 2013
FastIraq Inc	2010 – 2011
Litmore LLC	2012
Lyric Semiconductor	2010 – 2011
Office of the Secretary of Defense – Acquisition, Technology, & Logistics	2013 – present
Netgear, Inc	2011 – 2012
<i>Adjunct Scientist, IDA Center for Computer Sciences</i>	2010 – 2013
<i>Co-Founder &amp; CEO, Threedox Inc. (acquired by Optio Labs)</i>	2011 – 2012
<i>Consultant, WAA Associates LLC</i>	2003 – 2005

**Conference and Workshop Leadership**

## International Conference Leadership

<i>Workshop Co-Chair</i> , IEEE Personal, Indoor and Mobile Radio Communications (PIMRC)	2014
<i>TPC Co-Chair</i> , IEEE Dynamic Spectrum Access Networks (DySPAN)	2014
<i>Patron Co-Chair</i> , IEEE Communication and Network Security (CNS)	2013
<i>Symposium TPC Co-Chair</i> , IEEE International Conference on Communications (ICC)	2012

## Workshop Chair

Cognitive Radio Architectures for Broadband (CRAB) Workshop, ACM MobiCom	2013
Security in Communications Networks Workshop, IEEE LCN	2012

## TPC Member

IEEE International Conference on Computing, Networking and Communications (ICNC)	2015
IEEE Military Communications Conference (MILCOM)	2014
Cognitive Radio and Electromagnetic Spectrum Security (CRESS) Workshop, IEEE CNS	2014
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)	2014
IEEE Global Conference on Signal and Information Processing (GlobalSIP)	2013, 2014
IEEE Global Communications Conference (GLOBECOM)	2012, 2014
Conference on Decision and Game Theory for Security (GameSec)	2011
SEWCN Workshop, ICST SecureComm	2009

## Regional Events

<i>Local Chair</i> , Summer Cyber Workshop, US Cyber Challenge	2012
<i>Co-Chair</i> , Securing the Mobile Frontier, Center for Collaborative Government	2012
<i>Co-Chair</i> , Open Source Workshop, Wireless Innovation Forum	2011
<i>Chair</i> , Virginia Tech Mobile Security Workshop	2011
<i>Tutorial Chair</i> , Virginia Tech Wireless Symposium and Summer School	2011
<i>Chair</i> , GNU Radio Future Directions Workshop	2009, 2010
<i>General Chair</i> , WLAN/WMAN Symposium, Department of Defense	2006, 2008

**Training and Certifications**

<i>Amateur Radio Operator</i> , KB9ZNF	2001 – present
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**Teaching****Curriculum Development**

Cyber Security Graduate Certificate, Virginia Tech, College of Engineering	2013
Cyber Security Undergraduate Minor, Virginia Tech, College of Engineering	2012
Cyber Security Seminar, Virginia Tech, Electrical and Computer Engineering	2011
Information and Network Security, University of Maryland, MS Telecommunications Program	2008

**University Courses**

Network Security (ECE/CS 5584), Virginia Tech	2015
Telecommunication Networks (ECE 4614), Virginia Tech	2011, 2013, 2016
Network Architecture and Protocols II (ECE/CS 5566), Virginia Tech	2012
Special Study: Control Theory and the Dynamics of Cybersecurity, Virginia Tech	2014
Network Architecture and Protocols I (ECE/CS 5565), Virginia Tech	2013
Information Theory (ECE 5634), Virginia Tech	2011
Communications Networks (ENEE 426), University of Maryland	2008, 2009
Information and Network Security (ENTS 689i), University of Maryland	2008
<i>Teaching Assistant</i> , Cryptology (CMSC 456), University of Maryland	2003
<i>Teaching Assistant</i> , Communication Networks for Computers (ECE 438), University of Illinois	2001

**Short Courses, Seminars, and Tutorials**

Cybersecurity Technologies and Tactics (8 hours), Fujitsu Ltd	2014
Cellular Core Networks (40 hours), US Special Operations Command (SOCOM)	2012
Wireless Communications and Security (40 hours), Office of the Secretary of Defense	2012
Android Security (6 hours), L-3 Communications	2012
Cyberwarfare Strategy and Tactics (6 hours), Joint Inter-American Defense College	2011, 2012
Security Considerations for Tactical Wireless (4 hours), VT Wireless Summer School	2011
Wireless 4G Communications (8 hours), ProObject Speaker Series	2010
Introduction to Wireless LAN Security (8 hours), DOD Cryptanalytic Program	2005, 2006, 2008, 2009
Wireless Networks (24 hours), DOD Resident Signal Engineers Program	2007
Software-Defined and Cognitive Radio (4 hours), IEEE MILCOM	2007
UNIX Systems Administration using Solaris (16 hours), Indiana University	2001, 2002, 2003
Computer and Network Security (16 hours), Indiana University	2001

**Sponsored Research***>\$24M sponsored research, >\$6M gifts***Venture Capital Raised for University Startup Companies per Calendar Year**

\$17,000,000 in private equity to support startup companies commercializing university research	2014
\$2,350,000 in private equity to support startup companies commercializing university research	2012

**Philanthropic Gifts Received Per Calendar Year**

\$1,120,000 in gifts and industry dues to support research and education	2014
\$1,408,000 in gifts and industry dues to support research and education	2013
\$1,670,000 in gifts and industry dues to support research and education	2012
\$1,458,500 in gifts and industry dues to support research and education	2011

**Contract Vehicles and Cooperative Agreements**

IDIQ Contract Vehicle, AFRL (sub to MacB), ANSWER Program (\$47M ceiling)	2014 – 2019
IDIQ Contract Vehicle, US Army CERDEC (sub to Systek), TAOSS Program (\$500M ceiling)	2013 – 2018
Partnership Agreement, Center for Innovative Technologies, Mach37 Accelerator	2013 – 2016
CRADA, Defense Intelligence Agency, Science and Technology Directorate	2013 – 2016
IDIQ Contract Vehicle, AFRL (sub to L-3), Agile Cyber Technologies (\$300M ceiling)	2012 – 2018
IDIQ Contract Vehicle, AFRL (sub to MacB), IDARE Program (\$25M ceiling)	2012 – 2017
T&M Contract Vehicle, <i>sensitive sponsor</i> , Wireless Communications (\$100M ceiling)	2012 – 2015
Partnership Agreement, National Intelligence University, Cyber Education	2012 – 2015
Partnership Agreement, L-3 Communications, Cyber Security	2011 – 2016
CRADA, US Army CERDEC, Cyber Operations	2011 – 2016

**Sponsored Research**

1. **T. Clancy**, R. McGwier, "Mission Feasibility Study for Software Radio Waveforms", sensitive sponsor, \$1,242K, 2014-2015.
2. H. Trease, **T. Clancy**, M. Fowler, "Heterogeneous Parallel Mobile Computing for Cognitive Electronic Warfare", Office of Naval Research (ONR), \$894K, 2014-2016
3. **T. Clancy**, "Exploitation of Android Ad Libraries", L-3 Communications, \$44K, 2014-2015
4. **T. Clancy**, "Machine Learning for Target Models in Cognitive Electronic Warfare", \$42K, 2014-2015

5. **T. Clancy**, R. McGwier, “Resilient Tactical SATCOM Using Cognitive Radio: Phase 2”, Air Force Office of Scientific Research (AFOSR), with Shared Spectrum Company, \$293K, 2014-2015
6. J. Tront, **T. Clancy**, K. Cooper, “Virginia Tech CyberCorps: Federal Scholarship for Service”, National Science Foundation (NSF), \$3,909K, 2013-2018
7. R. McGwier, **T. Clancy**, “Experimental Software Defined Radio”, Harris Corporation, \$110K, 2014
8. **T. Clancy**, A. Abdelhadi, R. McGwier, “Spectral Coexistence using MIMO Radar Platforms”, Defense Advanced Research Projects Agency (DARPA/STO), \$349K, 2013–2014
9. R. McGwier, **T. Clancy**, “Tactical Platforms for Advanced Electronic Warfare”, Air Force Research Labs (AFRL), \$498K, 2013–2014
10. **T. Clancy**, R. McGwier, “Satellite Communications using DSA under Spectral Uncertainty”, United States Air Force (USAF), with Shared Spectrum Company, \$56K, 2013-2014
11. R. Tandon, **T. Clancy**, “Physical Layer Security: Information Theoretic Approach to Jamming”, L-3 Communications, \$237K, 2013–2014
12. S. Shukla, **T. Clancy**, “Application-Specific Firewall Synthesis Tool for High-Assurance Systems”, L-3 Communications, \$162K, 2013–2014
13. S. Sodagari, **T. Clancy**, “Using Asynchronous Weak-Commitment Search for Distributed Constraint Satisfaction for Autonomous Network Management”, Office of Naval Research (ONR), \$75K, 2013-2015.
14. P. Athanas, **T. Clancy**, “Novel Applications of FPGA Logic”, Air Force Research Labs (AFRL), with USC Information Sciences Institute, \$994K, 2013–2014
15. P. Athanas, R. Buehrer, R. McGwier, J. Reed, **T. Clancy**, “Software Defined Radio Technology Development”, *sensitive sponsor*, \$955K, 2012-2015
16. **T. Clancy**, “Advanced Threat Development for Cognitive Electronic Warfare Platforms”, Defense Advanced Research Projects Agency (DARPA/I2O), with MIT Lincoln Labs, \$300K, 2012–2013
17. **T. Clancy**, “Distributed/Cognitive EW for Agile/Adaptive Systems”, Air Force Research Labs (AFRL), with MacAulay Brown, \$142K, 2012–2013
18. R. McGwier, **T. Clancy**, P. Athanas, J. Reed, R. Buehrer, L. Beex, “Advanced Wideband Systems and Technologies”, *sensitive sponsor*, \$9,945K, 2012–2016
19. **T. Clancy**, R. McGwier, J. Reed, “Sharing and Shaping 4G Cellular Resources”, Allied Minds Federal Innovations, \$425K, 2012–2013
20. J. White, C. Dietrich, J. Reed, **T. Clancy**, R. McGwier, “Software Defined Radio Deployment Optimization”, *sensitive sponsor*, \$205K, 2012–2013
21. S. Sodagari, **T. Clancy**, R. McGwier, “Resilient Tactical SATCOM Using Cognitive Radio: Phase 1”, Air Force Office of Scientific Research (AFOSR), with Shared Spectrum Company, \$40K, 2012
22. **T. Clancy**, “Security and Robustness of TD-LTE for Public-Safety Communications”, NSF Security and Software Engineering Research Center (S2ERC), \$20K, 2012
23. **T. Clancy**, D. Yao, M. Hsiao, J. Park, J. Tront, “S2ERC @ Virginia Tech – Cyber Security I/UCRC”, National Science Foundation (NSF), \$325K, 2011–2016
24. **T. Clancy**, R. McGwier, S. Sodagari, “Spectral Coexistence through Cognitive Radar”, Office of Naval Research (ONR), with Shared Spectrum Company, \$1,482K, 2011–2014
25. **T. Clancy**, “Cognitive Electronic Warfare”, Naval Research Laboratory (NRL), \$297K, 2011–2014
26. **T. Clancy**, “Android Smartphone System Security”, L-3 Communications, \$318K, 2011–2012

27. **T. Clancy**, “High Performance IPv6 Security Gateway”, Department of Homeland Security (DHS), with Centripetal Networks Inc, \$35K, 2011–2012
28. **T. Clancy**, “Android Operating System Security”, Naval Postgraduate School (NPS), \$109K, 2011–2012
29. R. McGwier, **T. Clancy**, B. Agee, “Low-Cost Communications Satellite Design”, Los Alamos National Labs (LANL), \$292K, 2011–2012
30. **T. Clancy**, R. Buehrer, “Cellular Network Security Research”, Aerospace Corporation, \$129K, 2011–2012
31. **T. Clancy**, “Mobility and Spectrum Security Strategy and Policy”, Office of the Assistant Secretary of Defense and Chief Information Officer (DOD CIO), with JHU Applied Physics Laboratory, \$250K, 2011–2012
32. **T. Clancy**, “Secure Spectrum Access Policy Research”, Defense Advanced Research Programs Agency (DARPA/STO), with Shared Spectrum Company, \$50K, 2011–2012
33. **T. Clancy**, “Android Security Summer Workshop”, Virginia Tech Institute for Critical Technologies and Applied Sciences (ICTAS), \$27K, 2011
34. **T. Clancy**, “Mobile Wireless Communications Research”, JHU Applied Physics Laboratory (APL), \$35K, 2011
35. **T. Clancy**, “Cognitive Electronic Warfare”, Virginia Tech Institute for Critical Technologies and Applied Sciences (ICTAS), \$40K, 2011
36. **T. Clancy**, “Dynamic Spectrum Access Security Study”, Office of the Assistant Secretary of Defense for Networks and Information Integration (ASD-NII), with Shared Spectrum Company, \$60K, 2010–2011

## Research Supervision

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### Current Advisees and Co-Advisees

#### PhD Students

Amr Abed (co-advised with J. White)	2014 – present
Tugba Erpek	2013 – present
Michael Fowler	2012 – present
Mo Ghorbanzadeh	2011 – present
Seth Hitefield	2012 – present
Kiran Karra	2014 – present
Awais Khawar	2012 – present
Akshay Kumar (co-advised with R. Tandon)	2012 – present
Matt La Pan	2010 – present
Jasmin Mahal	2012 – present
John Narayan (co-advised with S. Shukla)	2014 – present
Tim O’Shea	2014 – present
Ian Roessle	2014 – present
Wile Seher	2012 – present
Avik Sengupta (co-advised with R. Tandon)	2012 – present
Chowdhury Shahriar	2011 – present
Haya Shajaiah	2012 – present

## Masters Students (with thesis)

Ross Bond	2013 – present
Chris Jennette	2012 – present
Jeremy Tate	2013 – present

## Masters Students (non-thesis)

Frank Balseca	2013 – present
Timothy Buttner	2014 – present
Ruth Stoehr	2013 – present

**Completed Advisees**

## PhD Students

N. Goergen, University of Maryland, PhD ECE (co-advised with R. Liu)	2011
<i>Dissertation: Extrinsic Channel-Like Fingerprinting for Transmitter Authentication in Wireless Systems</i>	

## Masters Students (with thesis)

Y. Chen, Virginia Tech, MS CS (co-advised with I.-R. Chen)	2013
<i>Thesis: Robust Prediction of Large Spatio-Temporal Datasets</i>	
T. Cooper, Virginia Tech, MS ECE (co-advised with J. Reed)	2012
<i>Thesis: Integration of Open Source GSM Networks</i>	
K. Karra, Virginia Tech, MS ECE	2012
<i>Thesis: Wireless Distributed Computing on the Android Platform</i>	
A. Khawar, University of Maryland, MS ECE	2010
<i>Thesis: Spectrum Sensing Security in Cognitive Radio Networks</i>	
N. Krishnan, Virginia Tech, MS CS (co-advised with J. Tront)	2014
<i>Thesis: Android Hypovisors: Securing Mobile Devices through High-Performance, Light-Weight Subsystem Isolation</i>	
R. Kurrle, Virginia Tech, MS ECE	2012
<i>Thesis: Resource Allocation for Smart Phones in 4G LTE-Advanced Carrier Aggregation</i>	
M. Lerch, Virginia Tech, MS ECE	2014
<i>Thesis: Using Decoys as a Resiliency Mechanism in Spectrally Harsh DSA Environments</i>	
A. Pham, Virginia Tech, MS ECE	2014
<i>Thesis: An Implementation of Utility-Based Traffic Shaping on Android Devices</i>	
Z. Ma, Virginia Tech, MS ECE	2013
<i>Thesis: Android Application Install-time Permission Validation and Run-time Malicious Pattern Detection</i>	
D. Sowers, Virginia Tech, MS ECE	2014
<i>Thesis: Architecture for Department of Defense Mobile Derived Credentials</i>	
T. Tsou, Virginia Tech, MS ECE (co-advised with J. Reed)	2012
<i>Thesis: Implementation of Wideband Multicarrier and Embedded GSM</i>	

## Masters Students (non-thesis)

K. Freeman, Virginia Tech, MEng ECE	2012
<i>Project: Applying Cognitive Radio Techniques in 5G Wireless</i>	
R. Horst, Virginia Tech, MEng ECE	2014
<i>Project: Security in the LTE S1-MME Link</i>	
J. Massey, Virginia Tech, MEng ECE	2014
<i>Project: Implementation of a Software-Based GPS Receiver</i>	
J. Narayan, Virginia Tech, MEng ECE	2013
<i>Project: Mitigating Effects of Bit Errors on Block Cipher Encrypted Wireless Data Links</i>	
K. Pandya, Virginia Tech, MEng ECE (co-advised with S. Sodagari)	2013
<i>Project: Survey of Different Dirty Paper Coding Methods</i>	
T. Patel, University of Maryland, MS Telecommunications	2008
<i>Project: Maxwell Lab – Over-the-Air Testbed for IEEE 802.16e</i>	



**Graduate Committees**

D. Ali, Virginia Tech, MS ECE	2012
<i>Thesis: Scalable Parameter Management using Case-Based Reasoning for Cognitive Radio Applications</i>	
H. Bae, Virginia Tech, PhD ECE	2014
<i>Dissertation: Fast and Scalable Structure-from-Motion for High-precision Mobile Augmented Reality Systems</i>	
A. Buchholz, Virginia Tech, MS CS	2013
<i>Thesis: Dual Path PKI Design for Secure Aircraft Data Communication</i>	
M. Davis, Virginia Tech, MS ECE	2013
<i>Thesis: Second-Order Cyclostationary Feature Based Detection of WiMAX Signal in Pulsed Noise Environments</i>	
D. Forestberg, Helsinki University of Technology, PhD CSE (pre-examiner)	2010
<i>Dissertation: Improving and Distributing Key Management on Mobile Networks</i>	
F. Hemmingway, University of Maryland, MS ECE	2013
<i>Thesis: An Analysis of Network Flow Records for Inferring Web Browser Redirection</i>	
A. Ibrahim, University of Maryland, PhD ECE	2009
<i>Dissertation: Relay Deployment and Selection in Cooperative Wireless Networks</i>	
M. Kracht, Virginia Tech, MS ECE	2014
<i>Thesis: Real-Time Embedded Software Modeling and Synthesis using Synchronous Data Flow Languages</i>	
A. Kumar, Virginia Tech, MS ECE	2012
<i>Thesis: Measurement of Antenna Performance in Analog LMR Systems Using PL Tone Analysis</i>	
A. Soysal, University of Maryland, PhD ECE	2008
<i>Dissertation: Optimum Transmit Strategies for Gaussian MIMO Systems with Partial CSI and Noisy Channel Estimation</i>	
B. Wang, University of Maryland, PhD ECE	2009
<i>Dissertation: Dynamic Spectrum Allocation and Sharing in Cognitive Cooperative Networks</i>	
Y. Wu, University of Maryland, PhD ECE	2010
<i>Dissertation: Game-Theoretic Strategies for Dynamic Behavior in Cognitive Radio Networks</i>	

**Honors and Awards**


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<i>Dean's Award for Research Excellence, Virginia Tech College of Engineering</i>	2014
<i>L-3 Communications Faculty Fellowship, Virginia Tech College of Engineering</i>	2013
<i>GAP-50 Finalist (Entrepreneurship Award), Commonwealth of Virginia</i>	2012
<i>Secretary of Defense Medal for the Global War on Terrorism, Department of Defense</i>	2011
<i>Best Student Paper Runner Up, IEEE Workshop on Signal Processing Systems</i>	2011
<i>Senior Member Status, Institute of Electrical and Electronics Engineers</i>	2010
<i>Letter of Commendation, United States Forces – Iraq J6</i>	2010
<i>Outstanding Paper Award, SDR Forum Technical Conference</i>	2007
<i>Joint Meritorious Unit Award, Department of Defense</i>	2007
<i>Outstanding Paper Award, SDR Forum Technical Conference</i>	2006
<i>Deckert-Foster Engineering Award, Department of Defense</i>	2006
<i>Best Paper Award, Virginia Tech Wireless Symposium</i>	2006
<i>Joint Meritorious Unit Award, Department of Defense</i>	2004
<i>Graduate Fellowship, University of Maryland, Department of Computer Science</i>	2003

## Publications

2700+ citations, H-Index 26

### Books and Book Chapters

- B1. **T. Clancy**, P. Morout, *Proceedings of the IEEE Conference on New Frontiers in Dynamic Spectrum Access Networks (DySPAN): Technology Track*, IEEE Xplore, May 2014.

### Refereed Journals and Periodicals – Under Submission

- J1. R. Tandon, S. Amuru, **T. Clancy**, R. Buehrer, "Towards Optimal Secure Distributed Storage Systems with Exact Repair", *IEEE Transactions on Information Theory*, under submission.
- J2. A. Abdelhadi, A. Khawar, **T. Clancy**, "Optimal Downlink Power Allocation in Cellular Networks", *IEEE Systems Journal*, under submission.
- J3. J. Narayan, S. Shukla, **T. Clancy**, "A Survey of Automatic Protocol Reverse Engineering Tools", *ACM Computing Surveys*, under submission.
- J4. A. Khawar, A. Abdelhadi, **T. Clancy**, "Target Detection Performance of Spectrum Sharing MIMO Radars", *IEEE Transactions on Mobile Computing*, under submission.
- J5. A. Khawar, A. Abdelhadi, **T. Clancy**, "QPSK Waveform for MIMO Radar with Spectrum Sharing Constraints", *IEEE Transactions on Wireless Communications*, under submission.
- J6. C. Shahriar, **T. Clancy**, R. McGwier, "Equalization Attacks against OFDM: Analysis and Countermeasures", *Wireless Communications and Mobile Computing*, Wiley, under submission.

### Refereed Journals and Periodicals – Published or Accepted for Publication

- J7. A. Sengupta, R. Tandon, **T. Clancy**, "Fundamental Limits on Caching with Secure Delivery", *IEEE Transactions on Information Forensics and Security*, to appear.
- J8. A. Kumar, A. Sengupta, R. Tandon, **T. Clancy**, "Dynamic Resource Allocation for Cooperative Spectrum Sharing in LTE Networks", *IEEE Transactions on Vehicular Technology*, to appear.
- J9. C. Shahriar, M. La Pan, M. Lichtman, **T. Clancy**, R. McGwier, R. Tandon, S. Sodagari, J. Reed, "PHY-Layer Resiliency in OFDM Communications: A Tutorial", *IEEE Communications Surveys & Tutorials*, vol. PP, (99), pp. 1-15, August 2014.
- J10. M. La Pan, **T. Clancy**, R. McGwier, "Physical Layer OFDM Acquisition and Timing Synchronization Security", *Wireless Communications and Mobile Computing*, Wiley, DOI 10.1002/wcm.2500, August 2014.
- J11. S. Amuru, R. Tandon, R. Buehrer, **T. Clancy**, "Retroactive Anti-Jamming for MISO Broadcast Channels", *IEEE Transactions on Information Theory*, vol. 60, (6), pp. 3593-3619, June 2014.
- J12. J. Mitola, J. Guerci, J. Reed, Y. Yao, **T. Clancy**, Y. Chen, Y. Guo, H. Li, H. Man, R. McGwier, "Accelerating 5G QoE via Public-Private Spectrum Sharing", *IEEE Communications Magazine*, vol. 52, (5), pp. 77-85, May 2014.
- J13. J. Park, J. Reed, A. Beex, **T. Clancy**, V. Kumar, B. Bahrak, "Security and Enforcement in Spectrum Sharing", *Proceedings of the IEEE*, vol. 102, (3), pp. 270-281, March 2014.
- J14. S. Sodagari, **T. Clancy**, "On Singularity Attacks in MIMO Channels," *Transactions on Emerging Telecommunication Technologies*, Wiley, DOI 10.1002/ett.2657, May 2013.
- J15. G. Zaki, W. Plishker, S. Bhattacharyya, **T. Clancy**, J. Kuykendall, "Integration of Dataflow-based Heterogeneous Multiprocessor Scheduling Techniques in GNU Radio", *Journal of Signal Processing Systems*, Springer, vol. 70, (2), pp. 177-191, February 2013.

- J16. J. Goodman, K. Rudd, **T. Clancy**, "Blind Multiuser Localization in Cognitive Radio Networks", *IEEE Communications Letters*, vol. 16, (7), pp. 1018-1021, July 2012.
- J17. Y. Wu, B. Wang, R. Liu, **T. Clancy**, "Anti-Jamming Games in Multi-Channel Cognitive Radio Networks", *IEEE Journal on Selected Areas in Communications*, vol. 30, (1), pp. 4-15, January 2012.
- J18. N. Goergen, W. Lin, R. Liu, **T. Clancy**, "Extrinsic Channel-Like Fingerprint Embedding for Authenticating MIMO Systems", *IEEE Transactions on Wireless Communications*, vol. 10, (12), pp. 4270-4281, December 2011.
- J19. N. Goergen, W. Lin, R. Liu, **T. Clancy**, "Extrinsic Channel-Like Fingerprinting Overlays Using Subspace Embedding", *IEEE Transactions on Information Forensics and Security*, vol. 6, (4), pp. 1355-1369, December 2011.
- J20. N. Goergen, R. Liu, **T. Clancy**, "Best Effort Cooperative Relaying", *IEEE Transactions on Wireless Communications*, vol. 10, (6), pp. 1833-1843, June 2011.
- J21. **T. Clancy**, A. Khawar, T. Newman, "Robust Signal Classification using Unsupervised Learning", *IEEE Transactions on Wireless Communications*, vol. 10, (4), pp. 1289-1299, April 2011.
- J22. B. Wang, Y. Wu, R. Liu, **T. Clancy**, "An Anti-Jamming Stochastic Game for Cognitive Radio Networks", *IEEE Journal on Selected Areas in Communications*, vol. 29, (4), pp. 877-889, April 2011.
- J23. B. Wang, R. Liu, **T. Clancy**, "Evolutionary Cooperative Spectrum Sensing Game: How to Collaborate?", *IEEE Transactions on Communications*, vol. 58, (3), pp. 890-900, March 2010.
- J24. Y. Wu, B. Wang, R. Liu, **T. Clancy**, "A Scalable Collusion-Resistant Multi-Winner Cognitive Spectrum Auction Game", *IEEE Transactions on Communications*, vol. 57, (12), pp. 3805-3816, December 2009.
- J25. **T. Clancy**, "On the Use of Interference Temperature for Dynamic Spectrum Access", *Annals of Telecommunications*, Springer, vol. 64, (7), pp. 573-585, August 2009.
- J26. B. Wang, Z. Ji, M. Abdulrehem, R. Liu, **T. Clancy**, "Primary-Prioritized Markov Approach for Dynamic Spectrum Allocation", *IEEE Transactions on Wireless Communications*, vol. 8, (4), pp. 1854-1865, April 2009.
- J27. Y. Wu, B. Wang, R. Liu, **T. Clancy**, "Repeated Open Spectrum Sharing Game with Cheat-Proof Strategies", *IEEE Transactions on Wireless Communications*, vol. 8, (4), pp. 1922-1933, April 2009.
- J28. B. Wang, Y. Wu, Z. Ji, R. Liu, **T. Clancy**, "Game Theoretical Mechanism Design for Cognitive Radio Networks with Selfish Users", *IEEE Signal Processing Magazine*, vol. 25, (6), pp. 74-84, November 2008.
- J29. **T. Clancy**, "Secure Handover in Enterprise WLANs: CAPWAP, HOKEY, and 802.11r", *IEEE Wireless Communications*, vol. 15, (5), pp. 80-85, October 2008.
- J30. **T. Clancy**, "Formalizing the Interference Temperature Model", *Journal on Wireless Communications and Mobile Computing*, Wiley, vol. 7, (9), pp. 1077-1086, November 2007.
- J31. **T. Clancy**, J. Hecker, T. O'Shea, E. Stuntebeck, "Applications of Machine Learning to Cognitive Radio Networks", *IEEE Wireless Communications*, vol. 14, (4), pp. 47-52, August 2007.
- J32. A. Mishra, M. Shin, N. Petroni, **T. Clancy**, W. Arbaugh, "Proactive Key Distribution using Neighbor Graphs", *IEEE Wireless Communications*, vol. 11, (1), pp. 26-36, February 2004.

**Refereed Conference and Workshop Papers – Under Submission**

- C1. A. Abdelhadi, **T. Clancy**, "Context-Aware Resource Allocation in Cellular Networks", *ACM SIGCOMM Capacity Sharing Workshop (CSWS)*, under submission.
- C2. C. Shahriar, A. Abdelhadi, **T. Clancy**, "Overlapped-MIMO Radar Waveform Design for Coexistence with Communication Systems", *IEEE Wireless Communications and Networking Conference (WCNC)*, under submission.
- C3. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Impact of Radar and Communication Coexistence on Radar's Detectable Target Parameters", *IEEE Wireless Communications and Networking Conference (WCNC)*, under submission.
- C4. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "A Price Selective Centralized Algorithm for Resource Allocation with Carrier Aggregation in LTE Cellular Networks", *IEEE Wireless Communications and Networking Conference (WCNC)*, under submission.
- C5. M. Ghorbanzadeh, E. Visotsky, P. Moorut, W. Yang, **T. Clancy**, "Radar In-band and Out-of-Band Interference into LTE Macro and Small Cell Uplinks in the 3.5 GHz Band" , *IEEE Wireless Communications and Networking Conference (WCNC)*, under submission.
- C6. A. Abdelhadi, **T. Clancy**, "An Optimal Resource Allocation with Joint Carrier Aggregation in 4G-LTE", *IEEE International Conference on Computing, Networking and Communications (ICNC)*, under submission.
- C7. M. Ghorbanzadeh, E. Visotsky, P. Moorut, W. Yang, **T. Clancy**, "Radar in-Band Interference Effects on Macrocell LTE Uplink Deployments in the U.S. 3.5 GHz Band", *IEEE International Conference on Computing, Networking and Communications (ICNC)*, under submission.
- C8. M. Ghorbanzadeh, A. Abdelhadi, A. Amanna, J. Dwyer, **T. Clancy**, "Implementing an Optimal Rate Allocation Tuned to the User Quality of Experience" *IEEE International Conference on Computing, Networking and Communications (ICNC)*, under submission.

**Refereed Conference and Workshop Papers – Published or Accepted for Publication**

- C1. M. Ghorbanzadeh, A. Abdelhadi, **T. Clancy**, "A Utility Proportional Fairness Radio Resource Block Allocation in Cellular Networks", *IEEE International Conference on Computing, Networking and Communications (ICNC)*, February 2015.
- C2. A. Kumar, R. Tandon, **T. Clancy**, "On the Latency of Heterogeneous MDS Queue", *IEEE Global Communications Conference (GLOBECOM)*, December 2014.
- C3. M. La Pan, **T. Clancy**, R. McGwier, "A Machine Learning Approach for Dynamic Spectrum Access Radio Identification", *IEEE Global Communications Conference (GLOBECOM)*, December 2014.
- C4. J. Tate, **T. Clancy**, "Secure and Tamper Proof Code Management", *ACM CCS Workshop on Cyber Security Analytics and Automation (SafeConfig)*, November 2014.
- C5. M. Ghorbanzadeh, A. Abdelhadi, **T. Clancy**, "A Utility Proportional Fairness Resource Allocation in Spectrally Radar-Coexistent Cellular Networks", *IEEE Military Communications Conference (MILCOM)*, October 2014.

- C6. C. Shahriar, C. Cole, **T. Clancy**, "Performance Impact of Imperfect CSI on Spatial Hiding Anti-Jam Communications", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C7. C. Cole, C. Shahriar, **T. Clancy**, "An Anti-jam Communications Technique via Spatial Hiding Precoding", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C8. A. Khawar, A. Abdelhadi, **T. Clancy**, "On The Impact of Time-Varying Interference-Channel on the Spatial Approach of Spectrum Sharing between S-band Radar and Communication System", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C9. M. La Pan, **T. Clancy**, R. McGwier, "An Assessment of OFDM Carrier Frequency Offset Synchronization Security for 4G Systems", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C10. M. Lichtman, J. Peck, V. Arellano, J. Reed, **T. Clancy**, "An Electronic Warfare Perspective of LTE", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C11. S. Hitefield, M. Fowler, C. Jennette, **T. Clancy**, "Link Hijacking through Wireless Exploitation of a Vulnerable Software Defined Waveform", *IEEE Military Communications Conference (MILCOM)*, October 2014.
- C12. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Multi-Application Resource Allocation with Users Discrimination in Cellular Networks", *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 2014.
- C13. A. Sengupta, R. Tandon, **T. Clancy**, "Decentralized Caching with Secure Delivery", *IEEE International Symposium on Information Theory (ISIT)*, July 2014.
- C14. A. Sengupta, R. Tandon, **T. Clancy**, "Fundamental Limits of Caching with Secure Delivery", *IEEE ICC Workshop on Wireless Physical Layer Security*, June 2014.
- C15. J. Mahal, **T. Clancy**, "The Closed-form BER Expressions of PSK Modulation for OFDM and SC-FDMA under Jamming and Imperfect Channel Estimation", *IEEE International Conference on Communications (ICC)*, June 2014.
- C16. R. Tandon, S. Amuru, **T. Clancy**, R. Buehrer, "Optimal Secure (3; 2; 2) and (4; 3; 3) Distributed Storage Systems with Exact Repair", *IEEE International Conference on Communications (ICC)*, June 2014.
- C17. Y. Chen, M. Ghorbanzadeh, K. Ma, **T. Clancy**, R. McGwier, "A Hidden Markov Model Detection of Malicious Android Applications at Runtime", *IEEE Wireless & Optical Communications Conference (WOCC)*, May 2014.
- C18. A. Sengupta, R. Tandon, **T. Clancy**, "Secure Caching with Non-Uniform Demands", *IEEE Global Wireless Summit (GWS)*, May 2014.
- C19. A. Khawar, A. Abdelhadi, **T. Clancy**, "A Mathematical Analysis of Cellular Interference on the Performance of S-band Military Radar Systems", *IEEE Wireless Telecommunications Symposium (WTS)*, April 2014.
- C20. A. Khawar, A. Abdelhadi, **T. Clancy**, "Spectrum Sharing between S-band Radar and LTE Cellular System: A Spatial Approach", *IEEE DySPAN Workshop on Shared Spectrum Access for Radar and Communications (SSPARC) Technologies*, April 2014.
- C21. A. Khawar, A. Abdelhadi, **T. Clancy**, "MIMO Radar Waveform Design for Coexistence with Cellular Systems", *IEEE DySPAN Workshop on Shared Spectrum Access for Radar and Communications (SSPARC) Technologies*, April 2014.

- C22. H. Shajaiah, A. Khawar, A. Abdelhadi, **T. Clancy**, "Resource Allocation with Carrier Aggregation in LTE Advanced Cellular System Sharing Spectrum with S-band Radar", *IEEE DySPAN Workshop on Shared Spectrum Access for Radar and Communications (SSPARC) Technologies*, April 2014.
- C23. A. Abdelhadi, **T. Clancy**, "A Utility Proportional Fairness Approach for Resource Allocation in 4G-LTE", *IEEE International Conference on Computing, Networking, and Communications (ICNC)*, February 2014.
- C24. V. Kumar, J. Park, **T. Clancy**, K. Bian, "PHY-Layer Authentication Using Hierarchical Modulation and Duobinary Signaling", *IEEE International Conference on Computing, Networking, and Communications (ICNC)*, February 2014.
- C25. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Spectrum Sharing between Public Safety and Commercial Users in 4G-LTE", *IEEE International Conference on Computing, Networking, and Communications (ICNC)*, February 2014.
- C26. A. Khawar, A. Abdelhadi, **T. Clancy**, "Beampattern Analysis for MIMO Radar and Telecommunication System Coexistence", *IEEE International Conference on Computing, Networking, and Communications (ICNC)*, February 2014.
- C27. S. Amuru, R. Tandon, R. Buehrer, **T. Clancy**, "Jamming Countermeasures for Multi-User MISO Broadcast Channels: A DoF Perspective", *IEEE Global Communications Conference (GLOBECOM)*, December 2013.
- C28. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Utility Proportional Fairness Resource Allocation with Carrier Aggregation in 4G-LTE", *IEEE Military Communications Conference (MILCOM)*, November 2013.
- C29. S. Amuru, R. Tandon, R. Buehrer, **T. Clancy**, "Interference Alignment for MISO Broadcast Channels under Jamming attacks", *IEEE Conference on Signals, Systems, and Computers (Asilomar)*, November 2013.
- C30. A. Abdelhadi, **T. Clancy**, "A Resource Allocation Algorithm for Multi-Application Users in 4G-LTE", *ACM MOBICOM Workshop on Cognitive Radio Architectures for Broadband (CRAB)*, October 2013.
- C31. V. Kumar, J. Park, **T. Clancy**, K. Bian, "PHY-Layer Authentication by Introducing Controlled Inter Symbol Interference", *IEEE Conference on Communications and Network Security (CNS)*, October 2013.
- C32. A. Abdelhadi, **T. Clancy**, "A Robust Optimal Rate Allocation Algorithm and Pricing Policy for Hybrid Traffic in 4G-LTE", *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, September 2013.
- C33. M. Ghorbanzadeh, Y. Chen, **T. Clancy**, R. McGwier, "Fine-Grained End-to-End Network Model via Vector Quantization and Hidden Markov Processes", *IEEE International Conference on Communications (ICC)*, June 2013.
- C34. C. Shahriar, S. Sodagari, R. McGwier, **T. Clancy**, "Performance Impact of Asynchronous Off-tone Jamming Attacks Against OFDM", *IEEE International Conference on Communications (ICC)*, June 2013.
- C35. M. La Pan, **T. Clancy**, R. McGwier, "Differential Scrambling Attack against OFDM Frequency Synchronization", *IEEE International Conference on Acoustics Speed and Signal Processing (ICASSP)*, May 2013.

- C36. C. Shahriar, R. McGwier, **T. Clancy**, "Performance Impact of Pilot Tone Randomization to Mitigate OFDM Jamming Attacks", *IEEE Consumer Communications and Networking Conference (CCNC)*, January 2013.
- C37. M. Ghorbanzadeh, Y. Chen, K. Ma, **T. Clancy**, R. McGwier, "A Neural Network Approach to Category Validation of Android Applications", *IEEE International Conference on Computing, Networking and Communications (ICNC)*, January 2013.
- C38. Y. Chen, F. Chen, J. Dai, **T. Clancy**, "Student-T Based Robust Spatio-Temporal Prediction", *IEEE International Conference on Data Mining (ICDM)*, December 2012.
- C39. S. Sodagari, A. Khawar, **T. Clancy**, R. McGwier, "A Projection-Based Approach for Radar and Telecommunication Systems Coexistence", *IEEE Global Conference on Communications (GLOBECOM)*, December 2012.
- C40. S. Cannon, Y. Shlyak, F. Perich, M. McHenry, M. Lerch, R. McGwier, **T. Clancy**, "Detecting and Mitigating Primary User Emulation Attacks against DSA", *IEEE Military Communications Conference (MILCOM)*, October 2012.
- C41. M. La Pan, **T. Clancy**, R. McGwier, "Jamming Attacks against OFDM Timing Synchronization and Signal Acquisition", *IEEE Military Communications Conference (MILCOM)*, October 2012.
- C42. T. Tsou, T. Cooper, R. McGwier, **T. Clancy**, J. Reed, "Development of an Open-Source GSM Femtocell and Integrated Core Infrastructure", *IEEE Military Communications Conference (MILCOM)*, October 2012.
- C43. S. Sodagari, **T. Clancy**, "Efficient Jamming Attacks on MIMO Channels", *IEEE International Conference on Communications (ICC)*, June 2012.
- C44. C. Shahriar, S. Sodagari, **T. Clancy**, "Performance of Pilot Jamming on MIMO Channels with Imperfect Synchronization", *IEEE International Conference on Communications (ICC)*, June 2012.
- C45. S. Sodagari, **T. Clancy**, "An Anti-Jamming Strategy for Channel Access in Cognitive Radio Networks", *Conference on Decision and Game Theory for Security (GameSec)*, November 2011.
- C46. G. Zaki, W. Plishker, S. Bhattacharyya, **T. Clancy**, J. Kuykendall, "Vectorization and Mapping of Software Defined Radio Applications on Heterogeneous Multi-Processor Platforms", *IEEE Workshop on Signal Processing Systems (SiPS)*, October, 2011. **(runner up, best student paper award)**
- C47. **T. Clancy**, "Efficient OFDM Denial: Pilot Jamming and Pilot Nulling", *IEEE International Conference on Communications (ICC)*, June 2011.
- C48. W. Plishker, G. Zaki, S. Bhattacharyya, **T. Clancy**, J. Kuykendall, "Applying Graphics Processor Acceleration in a Software Defined Radio Prototyping Environment", *IEEE International Symposium on Rapid System Prototyping (RSP)*, May 2011.
- C49. N. Goergen, W. Lin, R. Liu, **T. Clancy**, "Channel-Like Fingerprinting Overlays for Authenticating OFDM Signals Using Channel Side Information", *APSIPA Annual Summit and Conference*, December 2010.
- C50. N. Goergen, W. Lin, R. Liu, **T. Clancy**, "Authenticating MIMO Transmissions Using Channel-Like Fingerprinting", *IEEE Global Communications Conference (GLOBECOM)*, December 2010.
- C51. T. Newman, **T. Clancy**, M. McHenry, J. Reed, "Case Study: Security Analysis of a Dynamic Spectrum Access Radio System", *IEEE Global Communications Conference (GLOBECOM)*, December 2010.

- C52. N. Goergen, **T. Clancy**, T. Newman, "Physical Layer Authentication Watermarks Through Synthetic Channel Emulation", *IEEE Dynamic Spectrum Access Networks Conference (DySPAN)*, April 2010.
- C53. N. Goergen, R. Liu, **T. Clancy**, "Best Effort Cooperative Communication using Non-Dedicated Relays", *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, March 2010.
- C54. **T. Clancy**, T. O'Shea, "TRANSEC Mitigation Options for Wireless Metropolitan Area Networks", *IEEE Military Communications Conference (MILCOM)*, December 2009.
- C55. A. Khawar, **T. Clancy**, "Signal Classifiers using Self-Organizing Maps: Performance and Robustness", *SDR Forum Technical Conference (SDR)*, November 2009.
- C56. **T. Clancy**, A. Burnette, A. Agrawala, "MAXWell Lab: Building a WiMAX Forum Applications Laboratory", *IEEE Mobile WiMAX Symposium*, July 2009.
- C57. **T. Clancy**, A. Khawar, "Security Threats to Signal Classifiers Using Self-Organizing Maps", *International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom)*, June 2009.
- C58. T. Newman, **T. Clancy**, "Security Threats to Cognitive Radio Signal Classifiers", *Virginia Tech Wireless Personal Communications Symposium*, June 2009.
- C59. **T. Clancy**, K. Hoeper, "Making the Case for EAP Channel Bindings", *IEEE Sarnoff Symposium*, March 2009.
- C60. B. Wang, R. Liu, **T. Clancy**, "Evolutionary Game Framework for Behavior Dynamics in Cognitive Radio Networks", *IEEE Global Communications Conference (GLOBECOM)*, December 2008.
- C61. Y. Wu, B. Wang, R. Liu, **T. Clancy**, "Collusion-Resistant Multi-Winner Spectrum Auction for Cognitive Radio Networks", *IEEE Global Communications Conference (GLOBECOM)*, December 2008.
- C62. **T. Clancy**, R. McGwier, T. O'Shea, "On the Capacity of the Third-Party MIMO Receiver Channel", *IEEE Military Communications Conference (MILCOM)*, November 2008.
- C63. B. Walker, **T. Clancy**, J. Glenn, "Using Localized Random Walks to Model Delay-Tolerant Protocols", *IEEE Military Communications Conference (MILCOM)*, November 2008.
- C64. W. Lin, R. Liu, **T. Clancy**, "Modulation Forensics for Space Time Coding in Wireless Communications", *SDR Forum Technical Conference (SDR)*, October 2008.
- C65. Y. Wu, B. Wang, R. Liu, **T. Clancy**, "A Multi-Winner Cognitive Spectrum Auction Framework with Collusion-Resistant Mechanisms", *IEEE Dynamic Spectrum Access Networks Conference (DySPAN)*, October 2008.
- C66. M. Seligman, B. Walker, **T. Clancy**, "Delay-Tolerant Network Experiments of the MeshTest Wireless Testbed", *ACM MobiCOM Challenged Networks Workshop (CHANTS)*, pp. 49–56, September 2008.
- C67. A. Mills, B. Smith, **T. Clancy**, E. Soljanin, S. Vishwanath, "On Secure Communication over Wireless Erasure Networks", *IEEE International Symposium on Information Theory (ISIT)*, pp. 161–165, July 2008.
- C68. N. McCarthy, E. Blossom, N. Goergen, T. O'Shea, **T. Clancy**, "High-Performance SDR: GNU Radio and the IBM Cell Broadband Engine", *Virginia Tech Wireless Personal Communications Symposium*, June 2008.



- C69. **T. Clancy**, N. Goergen, “Security in Cognitive Radio Networks: Threats and Mitigation”, *International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CrownCom)*, May 2008.
- C70. A. Soysal, S. Ulukus, **T. Clancy**, “Channel Estimation and Adaptive M-QAM in Cognitive Radio Links”, *IEEE International Conference on Communications (ICC)*, pp. 4043–4047, May 2008.
- C71. B. Walker, **T. Clancy**, “A Quantitative Evaluation of the MeshTest Wireless Testbed”, *IEEE Conference on Testbeds and Research Infrastructures (TridentCom)*, March 2008.
- C72. T. O’Shea, **T. Clancy**, H. Ebeid, “Practical Signal Detection and Classification in GNU Radio”, *SDR Forum Technical Conference (SDR)*, November 2007.
- C73. **T. Clancy**, Z. Ji, B. Wang, R. Liu, “Planning Approach to Dynamic Spectrum Access in Cognitive Radio Networks”, *IEEE Global Communications Conference (GLOBECOM)*, November 2007.
- C74. B. Walker, J. Glenn, **T. Clancy**, “Analysis of Simple Counting Protocols for Delay-Tolerant Networks”, *ACM MobiCOM Challenged Networks Workshop (CHANTS)*, pp. 19–26, September 2007.
- C75. **T. Clancy**, “Dynamic Spectrum Access: The Capacity versus Complexity Tradeoff”, *Virginia Tech Symposium on Wireless Personal Communications*, June 2007.
- C76. **T. Clancy**, B. Walker, “MeshTest: Laboratory-Based Testbed for Large Wireless Topologies”, *IEEE Conference on Testbeds and Research Infrastructure (TridentCom)*, May 2007.
- C77. **T. Clancy**, “Achievable Capacity under the Interference Temperature Model”, *IEEE Conference on Computer Communications (INFOCOM)*, pp. 794–802, May 2007.
- C78. E. Stuntebeck, T. O’Shea, J. Hecker, **T. Clancy**, “Architecture for an Open-Source Cognitive Radio”, *SDR Forum Technical Conference (SDR)*, November 2006. **(outstanding paper award)**
- C79. **T. Clancy**, B. Walker, “Spectrum Shaping for Interference Management in Cognitive Radio Networks”, *SDR Forum Technical Conference (SDR)*, November 2006.
- C80. **T. Clancy**, B. Walker, “Predictive Dynamic Spectrum Access”, *SDR Forum Technical Conference (SDR)*, November 2006. **(outstanding paper award)**
- C81. **T. Clancy**, W. Arbaugh, “Measuring Interference Temperature”, *Virginia Tech Symposium on Wireless Personal Communications*, June 2006. **(best paper award)**
- C82. **T. Clancy**, N. Kiyavash, D. Lin, “Secure Smartcard-Based Fingerprint Authentication”, *ACM SIGMM Workshop on Biometrics Methods and Applications (WBMA)*, pp 45–52, November 2003.
- C83. N. Boston, **T. Clancy**, Y. Liow, J. Webster, “Genus Two Hyperelliptic Curve Coprocessor”, *Workshop on Cryptographic Hardware and Embedded Systems (CHES)*, Springer, LNCS vol. 2523, pp 400–414, August 2002.
- C84. J. Predina, K. Gibbs, B. Dames, Z. Kissel, B. Brosmer, **T. Clancy**, K. Galamback, R. Smith, C. Zawistoski, “Use of Apodization to Improve the Quality of Radiometric Measurements from Interferometric Sounders”, *Twelfth International TOVS Study Conference*, March 2002.

### Invited Papers

- I1. C. Carlson, V. Nguyen, S. Hitefield, T. O’Shea, **T. Clancy**, “Measuring Smart Jammer Strategy Efficacy Over the Air”, *IEEE CNS Workshop on Cognitive Radio and Electromagnetic Spectrum Security (CRESS)*, October 2014.

12. S. Hitefield, V. Nguyen, C. Carlson, T. O'Shea, **T. Clancy**, "Demonstrated LLC-Layer Attack and Defense Strategies for Wireless Communication Systems", *IEEE CNS Workshop on Cognitive Radio and Electromagnetic Spectrum Security (CRESS)*, October 2014.
13. A. Sengupta, S. Amuru, R. Tandon, R. Buehrer, **T. Clancy**, "Learning Distributed Caching Strategies in Small Cell Networks", *IEEE International Symposium on Wireless Communication Systems (ISWCS)*, August 2014.
14. R. Tandon, S. Amuru, **T. Clancy**, R. Buehrer, "Distributed Storage Systems with Secure and Exact Repair - New Results", *IEEE Information Theory and Applications (ITA)*, February 2014.
15. M. Lichtman, J. Reed, M. Norton, **T. Clancy**, "Vulnerability of LTE to Hostile Interference", *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, November 2013.
16. **T. Clancy**, M. Norton, M. Lichtman, "Security Challenges with LTE-Advanced Systems and Military Spectrum", *IEEE Military Communications Conference (MILCOM)*, November 2013.
17. M. La Pan, M. Lichtman, **T. Clancy**, R. McGwier, "Protecting Physical Layer Synchronization: Mitigating Attacks against OFDM Acquisition", *IEEE Global Wireless Summit (GWS)*, June 2013.
18. **T. Clancy**, "Confluence of Electronic Warfare and Computer Network Attack," *Emerging Technologies Conference*, Lawrence Livermore National Labs, November 2011.
19. C. Shahriar, S. Sodagari, **T. Clancy**, "Physical-Layer Security Challenges of DSA-Enabled TD-LTE," *Conference on Cognitive Radio and Advanced Spectrum Management (CogArt)*, October 2011.
110. S. Sodagari, **T. Clancy**, "Preemption, Fairness, and Security Dynamics in Heterogeneous DSA Environments," *IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC)*, September 2011.
111. G. Zaki, W. Plishker, S. Bhattacharyya, E. Blossom, T. O'Shea, N. McCarthy, **T. Clancy**, "Integration of Dataflow Optimization Techniques into a Software Radio Design Framework", *IEEE Conference on Signals, Systems, and Computers (Asilomar)*, November 2009.
112. **T. Clancy**, M. Beecher, I. Vo, B. Walker, "A Demonstration of the MeshTest Wireless Testbed", *IEEE Conference on Testbeds and Research Infrastructure (TridentCom)*, April 2009.
113. **T. Clancy**, "Adaptation Overhead in Time-Varying Cognitive Radio Channels", *IEEE CCNC Workshop on Cognitive Radio Networks (CRN)*, pp. 1009–1013, January 2008.
114. **T. Clancy**, "FPGA-based Hyperelliptic Curve Cryptosystems", *AMS Central Section Meeting, Special Session on Cryptography and Computational Number Theory*, April 2003.

#### Tech Reports, Preprints, and Theses

- T1. **T. Clancy**, "Security in Long Term Evolution and the Evolved Packet Core", Technical Report SR-2013-02, CTIA, October 2013.
- T2. J. White, **T. Clancy**, "Security of BYOD Mobility Models", Technical Report SR-2013-01, CTIA, September 2013.
- T3. **T. Clancy**, J. Mitola, A. Amanna, R. McGwier, J. Reed, "Comments on Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band", Federal Communications Commission, GN Docket No. 12-354, February 2013.
- T4. **T. Clancy**, "Security Recommendations for Military Use of Dynamic Spectrum Access Technology", Hume Center Tech Report VT-HCNST-10-002, Virginia Tech, July 2011.

- T5. **T. Clancy**, T. O'Shea, "Recommendations for Military Use of Wireless MAN Technology", Technical Report, Department of Defense, August 2009.
- T6. **T. Clancy**. "Dynamic Spectrum Access in Cognitive Radio Networks", *Ph.D. Dissertation*, University of Maryland, April 2006.
- T7. R. Blahut, **T. Clancy**, X. Hua, J. Kim, N. Kiyavash, M. Ma, K. Markandan, S. Mathur, M. Nigam, D. Pozdol, S. Song, S. Sriram, A. Suk, B. Wang, T. Wong, A. Vovchak, "Secure Middleware for Infrastructure Systems", Technical Report, Coordinated Science Laboratory, University of Illinois, January 2004.
- T8. **T. Clancy**, "Analysis of FPGA-based Hyperelliptic Curve Cryptosystems", *Master's Thesis*, University of Illinois, December 2002.

#### **Invention Disclosures (not yet filed as patents)**

- D1. J. White, **T. Clancy**, "Method to Use a Mobile Device Management System to Prevent Information Exfiltration by Messaging Services", Virginia Tech Intellectual Properties Disclosure 12-007.
- D2. **T. Clancy**, J. Reed, R. McGwier, "Method for the Use of Georeference Databases and Spectrum Sensing for Heterogeneous Spectrum Sharing in Mobile Broadband Networks", Virginia Tech Intellectual Properties Disclosure 12-125.
- D3. **T. Clancy**, J. Reed, R. McGwier, "Method for Operating a Market for Sublicensed Access to Electromagnetic Spectrum", Virginia Tech Intellectual Properties Disclosure 12-124.
- D4. A. Abdelhadi, **T. Clancy**, R. McGwier, J. Mitola, "Method for Optimal Resource Allocation with Carrier Aggregation for Cellular Networks", Virginia Tech Intellectual Properties Disclosure 12-163.
- D5. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Spectrum Sharing Between Public Safety and Commercial Groups of Users In 4G-LTE", Virginia Tech Intellectual Properties Disclosure 14-007.
- D6. H. Shajaiah, A. Abdelhadi, **T. Clancy**, J. Mitola, "Multiple Stage Resource Allocation from Multiple Network Operators with Carrier Aggregation in 4G-LTE", Virginia Tech Intellectual Properties Disclosure 14-006.

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- F1. A. Abdelhadi, **T. Clancy**, R. McGwier, J. Mitola, "System and Method for Optimal Resource Allocation Using Joint Carrier Aggregation", (US provisional filing 61/859,536), filed July 2013.
- F2. H. Shajaiah, A. Abdelhadi, **T. Clancy**, "Utility Proportional Fairness Resource Allocation with Carrier Aggregation in 4G-LTE", (US provisional filing 61/828,624), filed May 2013.
- F3. B. Dougherty, C. White, **T. Clancy**, D. Hamrick, G. Sharpe, R. Hanlin, K. Zienkiewicz, C. Thompson, "System and Method to Secure Short-Range Proximity Signals", (US provisional filing 61/781,252), filed March 2013.
- F4. B. Dougherty, C. White, **T. Clancy**, D. Hamrick, G. Sharpe, R. Hanlin, K. Zienkiewicz, C. Thompson, "System and Method for Securing the Boot Process of a Device using Credentials Stored on an Authentication Token", (US provisional filing 61/779,931), filed March 2013.
- F5. B. Dougherty, C. White, **T. Clancy**, D. Hamrick, G. Sharpe, R. Hanlin, K. Zienkiewicz, C. Thompson, "System and Method for Securing and Locating Computing Devices", (US provisional filing 61/785,109), filed March 2013.

- F6. B. Dougherty, C. White, T. Clancy, D. Hamrick, G. Sharpe, R. Hanlin, K. Zienkiewicz, C. Thompson, "System and Method for Enforcing Security in Mobile Computing", (US provisional filing 61/790,728), filed March 2013.
- F7. A. Amanna, **T. Clancy**, "Method of Network Sharing between Public Safety and Commercial Users", (US utility filing 14/206,504), filed March 2014.
- F8. A. Amanna, J. Mitola, R. Tandon, **T. Clancy**, J. Reed, R. McGwier, A. Sengupta, A. Kumar, "Method for Heterogeneous Spectrum Sharing Between Commercial Cellular Operators and Legacy Incumbent Users in Wireless Networks", (US utility filing 13/835,012), filed March 2013.
- F9. A. Amanna, J. Mitola, **T. Clancy**, J. Reed, R. McGwier, S. Hitefield, A. Pham, S. Bernales, M. Fowler, "Method of Distributed Data Management in Wireless Networks", (US utility filing 13/834,826), filed March 2013.
- F10. **T. Clancy**, R. Kurrle, A. Abdelhadi, "Method for Distributed Resource Allocation in LTE Networks Based on User Demand", (US provisional filing 61/787,317), filed March 2013.
- F11. **T. Clancy**, J. Mitola, R. McGwier, A. Abdelhadi, "Method for Radio Resource Shadow Pricing", (US provisional filing 61/787,367), filed March 2013.
- F12. **T. Clancy**, J. White, B. Dougherty, "Systems and Methods for Enforcing Security in Mobile Computing", (US utility filing 13/735,885; International PCT/US13/20575), filed January 2013.
- F13. J. Reed, H. Volos, R. Buehrer, K. Rele, M. Sohul, **T. Clancy**, R. McGwier, "Cognitive Radio Implementations for LTE", (US provisional filing 61/683,491), filed August 2012.
- F14. **T. Clancy**, J. White, "Method to Enforce Access Control Policies on Privileged Access for Mobile Devices", (US provisional filing 61/655,109), filed June 2012.
- F15. **T. Clancy**, J. White, "Applications of a Processor Trusted Zone for Enhanced Mobile Device Security", (US provisional filing 61/662,189), filed June 2012.
- F16. S. Sodagari, A. Khawar, **T. Clancy**, R. McGwier "A Projection Based Methodology for Radar and Telecommunication Systems Coexistence", (US provisional filing 61/646,453), filed May 2012.
- F17. J. White, **T. Clancy**, "Method to Enforce Security Policies on the Loading, Linking, and Execution of Native Code by Mobile Applications Running inside of Virtual Machines", (US utility filing 13/858,929), filed April 2013.
- F18. **T. Clancy**, N. Krishnan, S. Hitefield, "High Assurance Light-Weight Virtualization for Mobile Devices", (US provisional filing 61/614,005), filed March 2012.
- F19. **T. Clancy**, J. White, B. Dougherty, "Method to Enforce Data Provenance in Mobile Computing", (US provisional filing 61/583,605), filed January 2012.
- F20. J. White, **T. Clancy**, B. Dougherty, "Method to Enforce Security Policies using a Distributed Object-Oriented IPC Firewall", (US provisional filing 61/584,284), filed January 2012.
- F21. **T. Clancy**, J. White, B. Dougherty, "Method to Protect against Malware Threats in Mobile Computing", (US provisional filing 61/583,610), filed January 2012.

#### **Awarded Patents**

- P1. I. Lee, S. Yun, W. Arbaugh, **T. Clancy**, M. Shin, "Authentication Method for Wireless Distributed System", (US 7,756,510 awarded July 2010; EP 1,722,589 awarded November 2006), filed May 2006.

**IETF Internet Standards – Published RFCs**

- S1. S. Hartman (Ed), **T. Clancy**, K. Hoepfer, “Channel Binding Support for EAP Methods”, RFC 6677, Proposed Standard, July 2012.
- S2. **T. Clancy**, H. Tschofenig, “EAP Generalized PSK (GPSK)”, RFC 5433, Proposed Standard, February 2009.
- S3. S. Kelly, **T. Clancy**, “CAPWAP Threat Analysis for 802.11 Deployments”, RFC 5418, Informational, December 2008.
- S4. P. Calhoun, M. Montemurro, D. Stanley, B. O'Hara, R. Suri, N. Winget, S. Kelly, M. Williams, S. Hares, E. Rescola, P. Narasimhen, D. Harkins, S. Ponnuswamy, **T. Clancy**, “CAPWAP Protocol Specification”, RFC 5415, Proposed Standard, December 2008.
- S5. **T. Clancy**, M. Nakhjiri, V. Narayanan, L. Dondeti, “Handover Key Management and Re-Authentication Problem Statement”, RFC 5169, Informational, March 2008.
- S6. **T. Clancy**, W. Arbaugh, “EAP Password Authenticated Exchange”, RFC 4746, Informational, November 2006.

**IETF Internet Drafts – Expired**

- S7. **T. Clancy**, A. Lior (Ed), G. Zorn, K. Hoepfer, “EAP Method Support for Transporting AAA Payloads”, draft-clancy-emu-aaapay, Standards Track, November 2010.
- S8. **T. Clancy**, “HOKEY Re-authentication Protocol Plan”, draft-clancy-hokey-plan, April 2007.
- S9. **T. Clancy**, N. Petroni, W. Arbaugh, “Technique for Method-Specific Fast EAP Rekeying”, draft-clancy-eap-rekeying, February 2004.

**Invited Lectures, Talks, and Panels** *(not part of a conference paper presentation)*

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- L1. “Applications of Cognition to MIMO Radar for Spectrum Sharing”, Cognitive RF Workshop, Army Research Labs, Adelphi, MD, June 2014.
- L2. “Risk-Based Cybersecurity Regulation and the NIST Framework”, CIO Summit, Richmond, VA, June 2014.
- L3. “Broadband Access and the Digital Divide”, Virginia Wireless Association Seminar, Alexandria, VA, May 2014.
- L4. “Future Directions in Cyber Warfare and Electronic Warfare”, Naval Postgraduate School Foundation Roundtable, Washington, DC, April 2014.
- L5. “Future Directions in Cyber Warfare and Electronic Warfare”, Virginia Military Institute Seminar, Lexington, VA, April 2014.
- L6. “Convergence of Electronic Warfare and Cyber Warfare: First Principals”, Cyber/EW CAG, L-3 Communications, Arlington, VA, March 2014.
- L7. “The Science of Electronic Warfare: Bounds on Target Knowledge”, Sensors Directorate Seminar, Air Force Research Labs, Dayton, OH, February 2014.
- L8. “Control Theory and the Dynamics of Cybersecurity”, EECS With-It Seminar, Vanderbilt University, Nashville, TN, January 2014.
- L9. “Senior Leaders Panel”, US Army Future Warfare Division, Army Capabilities Integration Center, Williamsburg, VA, January 2014.

- L10. "Spectrum Sharing to Support Commercial use of Military Spectrum", Classified US Military Communications Conference, McLean, VA, November 2013.
- L11. "Keynote: Broadband Access and the Digital Divide", Exploring Loudoun County's Digital Divide, Ashburn, VA, November 2013.
- L12. "Cyber Security Research, Education, and Outreach at Virginia Tech", Dulles Chamber Innovate Conference, Dulles, VA, October 2013.
- L13. "Security Challenges with LTE-Advanced Systems and Military Spectrum", IEEE Communications Society (COMSOC) Baltimore Section, Linthicum, MD, October 2013.
- L14. "Vulnerability Assessment of Emerging Mobile Core Networks", Cellular Telephone Industry Association (CTIA), Cyber Security Working Group Meeting, Washington, DC, October 2013.
- L15. "Security and Management of Android Devices", Google Federal Technology Workshop, Washington, DC, June 2013.
- L16. "How Secure is Your Smartphone?" Wireless @ Virginia Tech Advisory Board Meeting, Blacksburg, VA, May 2013.
- L17. "Cyber-Physical Security: Hacking the Internet of Things", Virginia Tech Black Swan Seminar, Blacksburg, VA, April 2013.
- L18. "Secure Mobility: From RF to Apps", Electrical and Computer Engineering Seminar, Virginia Tech, Blacksburg, VA, April 2013.
- L19. "Research Directions in Security", Research Day, Virginia Tech Center for Embedded Systems and Critical Applications, Arlington, VA, March 2013.
- L20. "Cyber Warfare: Intersection of Technology and Analytics", DIA Five Eyes Analytic Training Workshop, Harrisonburg, VA, February 2013.
- L21. "Jamming and Next-Generation Commercial Waveforms", DOD CIO LTE Jamming Technical Exchange Meeting, McLean, VA, February 2013.
- L22. "Security and Management of Android Devices", Google Mobile Security Forum, Washington, DC, November 2012.
- L23. "Cyber Security Education", Cyber Innovation Symposium, Intelligence and National Security Alliance (INSA), Washington, DC, September 2012.
- L24. "Cyber Education and Research at Virginia Tech", NSA Information Assurance Symposium, Nashville, TN, August 2012.
- L25. "Cyber Security for Mobile Broadband Networks", Cellular Telephone Industry Association (CTIA), Cyber Security Working Group, Arlington, VA, July 2012.
- L26. "Cyber Security Innovation and Research", Virginia Tech Intelligence and Defense Executive Alumni Event, Arlington, VA, June 2012.
- L27. "Wireless and Mobile Security Trends", Center for High Assurance Computer Systems Seminar, Naval Research Laboratory, Washington, DC, June 2012.
- L28. "Security and Robustness of TD-LTE for Public Safety Applications", Security and Software Engineering Research Center (S2ERC) Showcase, Arlington, VA, May 2012.
- L29. "Cognitive Radar for Spectrum Coexistence", Communications Research Gathering, Office of Naval Research, Washington, DC, May 2012.
- L30. "Mobile Security Research and Trends", Northrop Grumman Mobile Community of Interest, McLean, VA, May 2012.

- L31. "Cybersecurity Research and Education at Virginia Tech", Cybersecurity Workshop and Panel, Office of Congressman Jim Moran, Arlington, VA, April 2012.
- L32. "Electronic Warfare and Cyber Warfare", Association of Old Crows, Naval Research Labs, Washington, DC, April 2012.
- L33. "Tactical ISR Challenges with 5G Cellular Communications", US Marine Radio Battalion Users' Conference, Monterey, CA, April 2012.
- L34. "Cybersecurity Research and Development at Virginia Tech", Panelist, Northern Virginia Technology Council, Vienna, VA, March 2012.
- L35. "Securing the Mobile Frontier", Panel Moderator, Executive Discussion on Cybersecurity and Mobility, Washington, DC, February 2012.
- L36. "Electronic Warfare in a Cyber Battlefield", IDGA Network Enabled Operations Summit, Alexandria, VA, January 2012.
- L37. "Making Sense of Intelligence through Visualization", ManTech WoW Technical Conference, Stafford, VA, September 2011.
- L38. "Security's Promising Directions and Biggest Challenges", Security and Software Engineering Research Center Workshop, Ball State University, Muncie, IN, May 2011.
- L39. "International Technology and Policy Impact of Cyber Warfare", Virginia Tech Cybersecurity Summit and Competition, Blacksburg, VA, April 2011.
- L40. "Cyber Security Panel", Panelist, Special Session on National Security: Cyber Security & Wireless Communications, Howard University, Washington, DC, September 2010.
- L41. "An Insider's View of Working for the US Federal Government", Intelligence Community Center of Academic Excellence Seminar, Virginia Tech, Blacksburg, VA, September 2010.
- L42. "TRANSEC and COMSEC Recommendations for a Military WiMAX Profile", DoD 802.16 Secure Profile Industry Day, McLean, VA, July 2009.
- L43. "Using Game Theory to Analyze Spectral Fairness and Robustness to Adversarial Agents in DSA Networks", DSO Workshop on Dynamic Spectrum Access, Arlington, VA, June 2009.
- L44. "Security Threats to Intelligent Networks", Department Seminar, Universidad de Murcia, Spain, May 2009.
- L45. "New protocol standards for wireless mobility: CAPWAP and HOKEY", Security for Seamless Mobility Forum, IEEE Globecom 2008, New Orleans, December 2008.
- L46. "Game Theory and Dynamic Spectrum Access", Emerging Spectrum Technology Workshop, Defense Spectrum Organization, March 2008.
- L47. "Security Threats to Intelligent Wireless Networks", Security and Privacy for 4G Workshop, IEEE Globecom 2007, Washington, DC, November 2007.
- L48. "Securing Next-Generation Mobile Networks: How Far Are We?", Panelist, Security and Privacy for 4G Workshop, IEEE Globecom 2007, Washington, DC, November 2007.
- L49. "Challenges in Signal Detection and Identification", SASDCRT Symposium, Naval Postgraduate School, Monterey, CA, September 2007.
- L50. "Software-Defined and Cognitive Radio", University of Maryland Telecommunications Seminar, College Park, MD, February 2007.
- L51. "Whither WiMAX?" Red Blue (ReBl) Symposium, Johns Hopkins Applied Physics Lab, Laurel, MD, October 2006.

- L52. "Open-Source Cognitive Radio", SASDCRT Symposium, Naval Postgraduate School, Monterey, CA, September 2006.
- L53. "Unlicensed Devices in Licensed Bands", Communications Seminar, University of Illinois Urbana-Champaign, Urbana, IL, May 2006.
- L54. "CAPWAP System Security", CAPWAP Working Group, Internet Engineering Task Force, Vancouver, BC, November 2005.
- L55. "Interference Temperature Multiple Access", Virginia Tech Wireless Seminar, Blacksburg, VA, November 2005.
- L56. "EAP Password Authenticated Exchange", EAP Working Group, Internet Engineering Task Force, San Diego, CA, August 2004.
- L57. "Password Authentication in the Wireless World", Rose-Hulman Institute of Technology, Terre Haute, IN, March 2004.
- L58. "Provably Secure Middleware for Distributed Application Development", Boeing Phantomworks, Seattle, WA, November 2003.
- L59. "FPGA-Based Hyperelliptic Curve Cryptosystems", AMS Central Section Meeting, Indiana University, Bloomington, April 2003.
- L60. "On the Feasibility and Security of Biometric Cryptosystems", Rose-Hulman Institute of Technology, Terre Haute, IN, March 2003.