

CURRICULUM VITAE
CHUNG-CHU (GEORGE) HSIEH
DEPARTMENT OF COMPUTER SCIENCE
NORFOLK STATE UNIVERSITY
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RESEARCH INTERESTS AND TECHNICAL EXPERTISE

- Information security (secure information sharing, cloud computing security, cryptography, critical infrastructure security, big data security, cybersecurity analytics)
- Network security (network infrastructure protection, secure communications, wireless security, network forensics)
- Data science and big data (Hadoop, machine learning, data mining, statistical analysis)

PROFESSIONAL PREPARATION

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|--|---------------------|-------|------|
| ▪ Northwestern University, Evanston, IL | Computer Science | Ph.D. | 1982 |
| ▪ Northwestern University, Evanston, IL | Computer Science | M.S. | 1980 |
| ▪ National Tsing Hua Univ., Taiwan, R.O.C. | Nuclear Engineering | B.S. | 1973 |

APPOINTMENTS

- Professor, January 2014 - Present
Department of Computer Science, Norfolk State University
- Professor and Graduate Program Coordinator, August 2011 - December 2013
Department of Computer Science, Norfolk State University
- Associate Professor and Graduate Program Coordinator, August 2002 - August 2011
Department of Computer Science, Norfolk State University
- Consultant, July 2001 - August 2002
Clients included Bell Labs, Lucent Technologies and SoftQuest Technologies, Inc.
- Director, August 2000 - July 2001
Messaging Applications Development, Bell Labs, Lucent Technologies
- Senior/Technical Manager, December 1986 - August 2000
Multimedia Response Systems Development, Bell Labs, AT&T/Lucent Technologies
- Member of Technical Staff, January 1982 - December 1986
Exploratory Switching Network Architecture, Bell Labs, AT&T

SIGNIFICANT RECENT AWARDS AND RECOGNITION

- 2016 Model Researcher Award, Office of Sponsored Programs @ NSU
- 2016 Excellence in External Funding Award, Office of Sponsored Programs @ NSU
- Virginia Outstanding Faculty Awards Finalist (2013 - 2014)
- University Professor of the Year Award, NSU (2012 - 2013)
- Star Award, College of Science, Engineering and Technology (CSET) at NSU, April 2013
- CSET Outstanding Researcher of the Year Award (2013 - 2014)
- CSET Outstanding Research Mentor of the Year Award (2012 - 2013)
- Computer Science Outstanding Research Mentor of the Year Award (2013 - 2015)
- Computer Science Outstanding Researcher of the Year Award (2013 - 2014, 2015 - 2016)

SAMPLE FUNDED RESEARCH

1. *Center of Excellence in Cyber Security*. Principal Investigator (PI). Funded by U.S. Department of Defense through a cooperative agreement with the Air Force Research Labs. \$4.983 million.

Apr. 14, 2015 - Apr. 14, 2020. The COE is consisted of two academic institutions: NSU (lead), and Old Dominion University.

2. *Enhancing Cybersecurity Research and Experimentation Infrastructure*. PI. Funded by U.S. Army Research Office (ARO). \$499,570. Aug. 18, 2016 - Aug. 17, 2017.
3. *Consortium for K-20 Cybersecurity Workforce Pipeline*. Co-PI. Funded by U.S. Department of Energy, \$25 million. Oct. 1, 2014 - Sep. 30, 2019. Responsibilities include research coordination.
4. *Massie Chair of Excellence in Information Assurance*. Investigator and team leader for the cloud computing security research subproject. Funded by U.S. Department of Energy. \$1.25 million overall project. Sep. 2009 - July 2015.
5. *Self-Protecting Security for Assured Information Sharing*. PI. Funded by ARO. \$479,008. Feb. 24, 2012 - Feb. 23, 2015.
6. *Building a Cloud Computing and Big Data Infrastructure for Cybersecurity Research and Education*. PI. Funded by ARO. \$497,725. Feb. 1, 2014 - Jan. 31, 2015.
7. *Joint Force Development*. PI for NSU as subcontractor to Northrop Grumman for DoD Joint Force Development program's continuously adaptive support for training and real-world operations. ID/IQ. May 2014 - present.
8. *Battlespace Awareness Pillar*. PI for NSU as subcontractor to SAIC for U.S. Navy to research, develop and operate C4ISR capabilities for Intelligence Operation. ID/IQ. Nov. 2012 - present.
9. *Information Assurance Techniques for Mobile Devices and Applications*. PI and faculty advisor. Funded by U.S. Army University Research Apprentice Program. \$8,220. May 2012 - Aug. 2012.
10. *Collaborative Research: Implementation of Vertically Integrated Curriculum for Cognitive Radio Communications*. PI. Funded by National Science Foundation. \$95,000. Sep. 2009 - Dec. 2011. In collaboration with Virginia Tech.
11. *Combination of iPads and Cloud Computing to Reduce Desktop Computer Usage*. PI and Faculty Advisor. Thurgood Marshall College Fund, Inc. \$5000. Dec. 2010 - Dec. 2011.
12. *Counter Irregular Threats to Air Operation*. PI and Faculty Advisor. Funded by U.S. Joint Forces Command (USJFCOM) and Virginia Modeling, Analysis, and Simulation Center (VMASC) at Old Dominion University. \$15,260. Nov. 2010 - Dec. 2010.
13. *Information Assurance Techniques for a Simulated Large-Scale Battlefield Environment*. Investigator and team leader for the information security research subproject. Funded by U.S. Army Research Laboratory. \$5.5 million for overall project. May 2005 - June 2010.
14. *Civil Communications Systems Consequence Modeling*. PI. Funded by USJFCOM and VMASC. \$295,000. Aug. 2004 - Apr. 2005.

SELECTED PUBLICATIONS (* denote NSU students)

1. Ali, A., Hsieh, G. and Khan, M., "Statistical Learning Methods for Cyber Security," in Proceedings of Society of Industrial and Applied Mathematics and Old Dominion University Mathematics Awareness Conference, Norfolk, Virginia, April 9, 2016.
2. Ali, A., Hsieh, G. and Khan, M., "Hardware Security Vulnerabilities and Cryptanalysis of Modern Data Encryption Algorithms," in Proceedings of Mathematical Association of America, Maryland-District of Columbia-Virginia Section, Germantown, MD, April 15 -16, 2016.
3. A. Ali, G. Hsieh and M. Khan, "Performance Metrics for Machine Learning Algorithms" Mathematical Association of America Conference, MD-DC-VA Section, Nov. 2015, Saint Mary's City, MD.
4. A. Ali, G. Hsieh and M. Khan, "Sequential Monte Carlo methods for online network intrusion detection systems," Mathematical Association of America Conference, MD-DC-VA Section, Apr. 2015, Roanoke College, VA.

5. A. Ali and G. Hsieh, "Analysis of Antenna Coupling and Magnetic Fields within the Near-Field Region," Mathematical Association of America, MD-DC-VA Section, Nov. 2014, Bowie State University, Bowie, Maryland.
6. G. Hsieh, R. Sye*, S. Vincent* and W. Hendricks, "Lessons Learned: Building a Big Data Research and Education Infrastructure," 2014 Int'l Conf. on Advances in Big Data Analytics (ABDA'14), pp. 209-215, July 2014, Las Vegas, NV.
7. C. Xin, M. Song, L. Ma, G. Hsieh and C.-C. Shen, "An Incentivized Cooperative Architecture for Dynamic Spectrum Access Networks," IEEE Transactions on Wireless Communications, vol. 12, no. 10, pp. 5154-5161, Oct. 2013.
8. G. Hsieh and E. Nwafor*, "A Self-Protecting Security Framework for CDA Documents," in Proc. 2013 Int'l Conf. on Security and Management (SAM'13), pp. 251-257, July 2013, Las Vegas, NV.
9. R. Mullanpudi* and G. Hsieh, "A Monitored Student Testing Application Using Cloud Computing," in Proc. 2013 Int'l Conf. on Frontiers in Education: Computer Science and Computer Engineering (FECS'13), pp. 433-439, July 2013, Las Vegas, NV.
10. G. Hsieh, D. Paruchuri*, C. Steward*, E. Nwafor* and D. Gadam*, "Lessons Learned: Porting Java Applications to Android," in Proc. 2013 Int'l Conf. on Software Engineering Research and Practice (SERP'13), pp. 530-536, July 2013, Las Vegas, NV.
11. Z. Qin, Q. Li, and G. Hsieh, "Defending Against Cooperative Attacks in Cooperative Spectrum Sensing," IEEE Transactions on Wireless Communications, vol. 12, no. 6, pp. 2680-2687, June 2013.
12. G. Hsieh and R.-J. Chen, "Design for a Secure Interoperable Cloud-Based Personal Health Record Service," in Proc. IEEE CloudCom 2012 Conf., Dec. 3-6, 2012, Taipei, Taiwan, R.O.C.
13. Daniel E. Burgner*, Luay A. Wahsheh, Jonathan M. Graham and George Hsieh, "Cyber Security and Portability of Electronic Medical Records," Journal of Information Assurance and Security, 7(5):355-365, 2012.
14. T. Smith-Jackson, T. Bose, C. Dietrich, G. Hsieh, C. Xin, D. DePoy and R. Thamvichai, "Evaluation of Integrated and Inclusive Pedagogy for Cognitive Communications," in Proc. 56th Annual Meeting of the Human Factors & Ergonomics Society (HFES 2012), Oct. 22-26, 2012, Boston, MA.
15. R. Sands*, G. Hsieh, W. Hendricks and A. Williams, "Building a Secure Virtual Lab Infrastructure for IT Education," in Proc. 2012 Int'l Conf. on Frontiers in Education: Computer Science and Computer Engineering (FECS'12), July 2012, Las Vegas, NV.
16. J. Wang, M. Song, G. Hsieh and C. Xin, "Minimum Cost Broadcast in Multi-radio Multi-channel Wireless Mesh Networks," in Proc. 7th Int'l Conf. on Mobile Ad-hoc & Sensor Networks (MSN'11), pp. 238-247, Dec. 2011, Beijing, China.
17. C. Chen, M. Song, G. Hsieh and C. Xin, "A PLL based Approach to building an Effective Covert Timing Channel," in Proc. IEEE Global Communications Conf. (Globecom 2011), pp. 1-5, Dec. 2011, Houston, TX.
18. G. Hsieh, "Towards Self-Protecting Security for e-Health CDA Documents," in Proc. Int'l Conf. on Security and Management (SAM 2011), pp. 637-643, July 2011, Las Vegas, NV.
19. G. Hsieh and M. Masiane*, "Towards an Integrated Embedded Fine-Grained Information Protection Framework," in Proc. Int'l Conf. on Information Science and Applications (ICISA 2011), pp. 1-8, Apr. 2011, Jeju Island, Korea.
20. C. Xin, M. Song, L. Ma, G. Hsieh and C.-C. Shen, "On Random Dynamic Spectrum Access for Cognitive Radio Networks," in Proc. IEEE Global Communications Conf. (Globecom), pp. 1-5, Dec. 2010, Miami, FL.

21. C. Xin, M. Song, L. Ma, G. Hsieh and C.-C. Shen, "Network Coding Relayed Dynamic Spectrum Access," in Proc. 2nd ACM SIGMOBILE Workshop on Cognitive Wireless Networking (CoRoNet), pp. 31-36, Sep 2010, Chicago, IL.
22. C. Xin, G. Hsieh and X. Cao, "Routing and Wavelength Assignment for an Agile Optical Network," in Proc. 2010 Int'l Conf. on Electronics and Information Engineering (ICEIE), pp.V1-432-V1-436, Aug. 2010, Kyoto, Japan.
23. M. Song, G. Patrick and G. Hsieh, "Detection of Compromised Wireless Sensor Nodes," Invited book chapter, Handbook on Sensor Networks, Y. Xiao, H. Chen, and F.H. Li (editors). pp. 497-514, Hackensack, NJ: World Scientific Publishing Company, August 2010.
24. C. Chen, M. Song and G. Hsieh, "Intrusion Detection of Sinkhole Attacks in Large-scale Wireless Sensor Networks," in Proc. 2010 IEEE Int'l Conf. on Wireless Communications, Networking and Information Security (WCNIS2010), pp.711-716, June 2010, Beijing, China.
25. G. Hsieh, R. Meeks* and L. Marvel, "Supporting Secure Embedded Access Control Policy with XACML+XML Security," in Proc. 5th Int'l Conf. on Future Information Technology (FutureTech 2010), pp.1-6, May 2010, Busan, Korea.
26. H. Gao, S. Utecht, G. Patrick, G. Hsieh, F.Y. Xu, H. D. Wang and Q. Li, "High Speed Data Routing in Vehicular Sensor Networks," Journal of Communications, vol. 5, no. 3, pp. 181-188, March 2010.
27. G. Hsieh, K. Foster*, G. Emamali*, G. Patrick and L. Marvel, "Using XACML for Embedded and Fine-Grained Access Control Policy," in Proc. 4th Int'l Conf. on Availability, Reliability and Security (ARES '09), pp. 462-468, Mar. 2009, Fukuoka, Japan.
28. G. Hsieh, G. Patrick, K. Foster*, G. Emamali* and L. Marvel, "Integrated mandatory access control for digital data," in Proc. SPIE 2008 Defense + Security Conf., vol. 6973, pp. 697302-1 to 697302-10, Mar. 2008, Orlando, FL.
29. C. Hsieh and B. Zhu*, "Applying Mapping Mashup Techniques for Integrating Real Estate Information," in Proc. 2008 ICOMP Conf., pp. 276-282, July 2008, Las Vegas, NV.
30. C. Hsieh and T. Traylor*, "PSWN Consequence Modeling: A Case Study," in Proc. 2007 Homeland Security Symposium on Cascading Infrastructure Failures: Avoidance and Response, pp. 165-172, May 2007, Washington DC.

TEACHING, MENTORING, AND SUPPORTING STUDENTS

- Graduate Program Coordinator for the Computer Science Department at NSU and academic advisor to all students in the graduate program, from 2002 through 2013.
- Leverage 20 years of industry R&D experiences in technology/product planning and development, and management of teams/projects with annual budgets up to \$15 million and staff up to 200 persons.
- Directing 4 M.S. Thesis/Project research in progress (active).
 1. *Malware Analysis and Detection Using Machine Learning Techniques*. Christopher A. Okonkwo. M.S. Thesis. Target completion date: Dec. 2016.
 2. *Evaluating the Effectiveness of ReputScore, an Open-Source IP Reputation Algorithm*. Darryl Walden. M.S. Thesis. Target completion date: Dec. 2016.
 3. *An Automated Cyber Attacker System*. Vamshika Boinapally. M.S. Project. Target completion date: Dec. 2016.
 4. *Integrating MySQL Proxy Application for Database Access Control*. M.S. Project. Target completion date: Dec. 2016.
- Directed 32 completed M.S. Thesis/Project research. Research topics include big data, cloud computing, information security, network security, and mobile computing.

1. *An Integrated Cyber Security Learning and Experimentation Environment*. Kaila M. Perry. M.S. Thesis. July 2016.
2. *Implementing Machine Learning Based Intrusion Detection Techniques Using R, Hadoop and H2O*. Vivek Paul Kanumuri. M.S. Project. Jan. 2016.
3. *Implementing Machine Learning Based Intrusion Detection Techniques Using R, Hadoop and H2O*. Anuraag Jayaseela Vidyasagar. M.S. Project. Jan. 2016.
4. *Design and Implementation of Enterprise Virtual Data Center and Private Cloud Environments Using VMware Software*. Bruk Befekadu. M.S. Project. July 2015.
5. *Building a Private Cloud Based Virtual Lab Infrastructure Using VMware vCloud*. Maurice Lightfoot. M.S. Project. Feb. 2015.
6. *Using Accumulo to Provide Access Control for Hadoop-Based Big Data*. Venkata Ramya Perumalla. M.S. Project. Dec. 2014.
7. *Network Security Analysis using Big Data Platform*. Raymond Sye. M.S. Thesis. Nov. 2014.
8. *Design and Implementation of a vCloud Enabled Secure and Scalable Virtual Lab Infrastructure*. Terrell S. Evans. M.S. Project. June 2014.
9. *Managing Hadoop Big Data Environments Using Cloudera and Hortonworks Cluster Management Tools*. Shontae M. Vincent. M.S. Project. May 2014.
10. *Windows Analysis using Open Source Forensics Tools*. Hanan Alatawi. M.S. Project. May 2014.
11. *DesDROID: Securing Social Networking Applications Metadata on Android Devices*. Dominique C. Calder. M.S. Thesis. May 2014.
12. *A Design for Interworking between the Self-Protecting Security Framework and Connect*. Lawrence T. Stroman. M.S. Project. April 2014.
13. *Upgrading the Design and Implementation of a Secure and Scalable Virtual Lab Infrastructure*. Daryl A. England. M.S. Project. April 2014.
14. *Applying Advanced Cryptographic Schemes for Smart Grid Systems*. John P. O'Sullivan. M.S. Project. Feb. 2014.
15. *Securing CDA Document Using XACML*. Ebelechukwu Nwafor. M.S. Thesis. July 2013.
16. *Developing a Personal Health Record Application for Android Platform*. Dwijitha Paruchuri. M.S. Thesis. April 2013.
17. *Generating CDA Documents and Embedding XML Security*. Deepika Gadam. M.S. Thesis. March 2013.
18. *Implementing Cisco Adaptive Security Appliance in a Small-Medium Business Environment*. Zengraft V. Grimes. M.S. Project. Jan. 2013.
19. *Monitored Student Testing Service using Cloud Computing*. RamaKrishna Mullapudi. M.S. Project. Jan. 2013.
20. *Flex Based Freight Management System using Sun SPOT*. Archana Rajpalem. M.S. Project. April 2012.
21. *Building Secure Virtual Lab Environments using VMware Virtualization Infrastructure*. Reginald A. Sands. M.S. Project. Dec. 2011.
22. *Integrating XKMS into A Secure Embedded Fine-Grained Access Control Framework*. Moeti Masiane. M.S. Thesis. July 2010.
23. *Information Protection Techniques for Integrated XACML Documents*. Ryan A. Meeks. M.S. Thesis. May 2010.
24. *Implementing Secure Wireless Service for Small Office Environments*. Emmanuel Obasi. M.S. Project. Jan. 2010.

25. *A Java Implementation of Pairing-Based Cryptography*. Christopher Ruddick. M.S. Thesis. Nov. 2009.
 26. *Implementing Voice over Internet Protocol (VoIP) for Small-Office Environments*. Saa Millimono. M.S. Project. Aug. 2009.
 27. *Implementing Secure Networks for High-Security, Small-Office Environments*. Kolade Salaam. M.S. Project. Aug. 2008.
 28. *Implementing Secure Networks for High-Security, Small-Office Environments*. David Clinton. M.S. Project. Aug. 2008.
 29. *Integrated Document Mandatory Access Control: Policy Decision*. Gerald Emamali. M.S. Thesis. Aug. 2008.
 30. *Document Mandatory Access Control: Policy Creation and Enforcement*. Keith E. Foster. M.S. Thesis. July 2008.
 31. *Applying Mashup and Mapping Technologies for Integrating Real Estate Information*. Bing Zhu. M.S. Thesis. Jan. 2008.
 32. *Consequence Modeling of Public Safety Communication Systems Using UML*. Jennifer Grow. M.S. Thesis. Aug. 2005.
- Directed 23 completed undergraduate students (14 projects) for B.S. Seminar research. Research topics include big data, cloud computing, information security, network security, mobile computing, and visualization. Directing 1 B.S. Seminar research project on virtualization platforms and automated provisioning.

PROFESSIONAL MEMBERSHIPS AND CERTIFICATIONS

- Institute of Electrical and Electronic Engineering, Association of Computing Machinery, Tau Beta Pi (Engineering Honor Society), Upsilon Pi Epsilon (Computer Science Honor Society)
- GIAC Certified Perimeter Protection Analyst (GPPA) from Global Information Assurance Certification (GIAC), 2007-2019.

CITIZENSHIP: US

[September 2016]