Dr. Char Sample
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ACADEMIC TRAINING:

Degrees:

Doctor of Science, Information Assurance, Capitol College (Laurel, Maryland) May 2013

Title: Culture and Computer Network Attack Behaviors

Master of Science, Systems Management, Capitol College (Laurel, Maryland) May 1995

Concentration: Telecommunications Systems

Bachelor of Science, University of Pittsburgh, August 1984.

Major: Computer Science Minor: Math

RESEARCH AREAS:

Interdisciplinary research combining social sciences and cybersecurity, data fidelity, artificial intelligence, malicious use of artificial intelligence, machine learning, adversarial machine learning, fake news, threat intelligence, metrics, cyber operations modeling and simulation, cyber mission force development and preparation, DNS security, routing security, security architecture issues, anomaly detection techniques, big data, cloud security analytics, quantifying behaviors, firewalls, IDS and monitoring solutions.

PUBLICATIONS:

- *ZTA: Zero Trust, But Verify, European Conference on Cyber Security and Warfare, June 2022*
- *Interdisciplinary Lessons Learned While Researching Fake News,* Frontiers, December 2020.
- *Data Resilience: An Interdisciplinary Approach,* IEEE Resilience Week, 2020.
- *A Cross-discipline Approach to Countering 4th Generation Espionage,* European Conference on Cyber Security and Warfare, 2019.
- *Fake News: A Method for Measuring Distance from Fact,* Big Data Disinformation Workshop December 2018.
- *A Model for Evaluation Fake News,* US Army Cyber Defense Journal, December 2018.
- *A Model for Evaluating Fake News,* CyCon US 2018, November 2018.
- *Simulations in Cybersecurity: A Review of Cognitive Modeling of Network Attackers, Defenders and Users,* Frontiers in Psychology, section Cognitive Science.
- *A Cultural Exploration of Social Media Manipulators,* European Conference on Cyber Security and Warfare, 2018.
- *Data Fidelity in the Post Truth Era Part 1: Network Data,* International Conference on Cyber Security and Warfare, 2018.
- *Psychological Behavioral Examinations in Cyber Security,* Book Chapter, 2018.
- *Culture + Cyber: Exploring the Relationship,* Applied Human Factors and Ergonomics Conference, 2017.
- *Cultural Observations on Social Engineering Victims*, European Conference on Cyber Security and Warfare, 2017.
- *Data Fidelity: Security's Soft Underbelly*, Recent Challenges in Information Science (RCIS) 2017.
- *Cultural Exploration of Attack Vector Preferences for Self-Identified Attackers* (RCIS) 2017.
- *What's in a Name? Cultural Observations on Nationally Named Hacking Groups*, International Conference on Cyber Security and Warfare, 2017.
- *Re-thinking Threat Intelligence*, CyCon October 2016.
- *Cyber + Culture Early Warning Study*, SEI 2015.
- Using Hofstede's Cultural Dimensions to Gain Insight into Social Networking Site Adoption Rates, book chapter in *Analyzing the Strategic Role of Social Media in Firm Growth and Productivity.*
- *Culture and Cyber Behaviours: DNS Defending*, European Conference on Cyber Warfare and Security, July 2015.

- *Application of Hofstede’s Cultural Dimensions in Social Networking,* European Conference on Social Media (ECSM) 2014, July 2014.
- *Attribution Beyond the IP,* e-Forensics, March 2014.
- *Hofstede’s Cultural Markers in Computer Network Attack Behaviors,* ICCWS 2014.
- *A Different Perspective on Attribution,* CyberTalk, Spring 2014.
- *Applicability of Cultural Markers in Computer Network Attack Attribution*, ECIW 2013.
- *An Overview of Anomaly Detection*, IT Professional IEEE January 2013.
- *Cloud computing security: Routing and DNS Threats*, TechTarget 2012.
- *IaaS security puts spotlight on hypervisor security, tenant management*, TechTarget 2012.
- *An examination of PaaS security challenges*, TechTarget, 2012.
- *Types of DNS Attacks Reveal DNS Defense Tactics,* TechTarget, 2012.

PRESENTATIONS:

- *RSAC 2020,* San Francisco, CA
- *IEEE Big Data Disinformation Workshop*, Seattle, Washington
- *NATO MARCOMM, Fake News,* Northwood, UK
- *NATO CyCon US,* Washington, DC (2016, 2018)
- *University of New South Wales & DSTG,* Canberra, Australia.
- *COSAC,* Naas, Ireland (2011 – 2022)
- *International Conference on Cyber Warfare and Security,* (2014 – 2019) (track chair 2017 - 2021).
- *NATO – Norfolk State University Cyber Security Workshop,* 2017, Norfolk, VA
- *British Computing Society,* Cambridge, UK and London UK, 2017
- *Recent Challenges in Information Science,* 2017, Brighton, UK
- *Cyber Security Practitioner’s Workshop, (*2014 – 2018) York, UK
- *European Conference on Cyber Warfare and Security,* 2013 - 2020 (track chair 2016-2021), Dublin, Ireland
- *Applied Human Factors and Ergonomics,* 2017, Los Angeles, CA
- *Cardiff University, 2017,* Cardiff, UK
- *Suits and Spooks* 2015, Washington DC and London, UK.
- *ISACA Conference,* October 2014, Dublin, Ireland
- *2nd Annual Psyber Security Workshop,* August 2014, Ft. Meade, Maryland
- *European Conference on Social Media,* July 2014, University of Brighton, Brighton, UK
- *ISACA Dublin,* March 2014, Dublin, Ireland
- *ISACA Belfast,* March 2014, Belfast, Ireland
- *44Con,* September 2013, London, England
- *National Information Security Conference,* June 2013, Glasgow Scotland
- *Shmoocon,* January 2012, Washington, DC

PATENTS and HONORS:

- Resilience Week, Data Fidelity: An Interdisciplinary Approach, 2020
- Best PhD Paper and Presentation, European Conference on Information Warfare and Security 2013
- Recognized inventor of Web Host Intrusion Prevention System (WHIPS), Verizon awarded patent in 2006
- Recognized inventor of Console Host Resource Management System (CHRMS); Verizon awarded patent in 2006

INDUSTRY EXPERIENCE:

ICF Inc. Fairfax, VA May 2022 – present

- Support the National Science Foundation (NSF) with efforts to evaluate research proposals in computer science, network science and cybersecurity.
- Support NSF with efforts to manage research programs and develop early career researchers.

Modern Technology Solutions Incorporated, Alexandria, VA, April 2021 – March 2022
Cybersecurity Principal Researcher

- Contributing investigator for the Office of the Secretary of Defense Undersecretary for Research and Engineering, Cyber Operations Study and other topics related to the Joint Architecture Design Command and Control capabilities initiative.
- Advisor Special Capabilities Office, as needed for specific studies.

The Idaho National Laboratory, Idaho Falls, ID, August 2019 – March 2021
Chief Research Scientist Cybercore Division

- Principal investigator of the data resilience initiative for the Boise State-INL-UC Davis, used for contextualizing ICS data.
- Principal investigator for proposed Fingerprinting and countering initiative INL-University of Warwick-IUPUI-Purdue University.
- Responsible for INL National & Homeland Security division Artificial Intelligence and Machine Learning strategy, focused on AI/ML failure analysis.
- Set strategic vision for interdisciplinary cybersecurity studies for industrial control systems security, cyber-physical systems, artificial intelligence, threat intelligence and human-machine studies.
- Define AI/ML strategy for both INL overall and the National & Homeland Security (N&HS) directorate.
- Internal board member determining allocations for internal funding research at INL.

ICF Inc., Fairfax, VA, January 2016 – July 2019
Technical Director – Fellow

- Lead investigator variety of cyber security studies in behavioral analysis, combining deep technical understanding of cyber security and cultural behaviors to determine the role of national culture in cyber behaviors of attackers, victims and defenders. Quantitative studies analysis relied on using R.
- Fake News research combining Linguistic analysis with SIGINT on pattern spread.
- Data Fidelity (precursor to Data Resilience) investigating the critical components missing in information security to determine veracity of input data.

MITRE, Bedford, MA, September 2015 – January 2016
Principal Security Architect/Researcher

- HHS security architecture with an emphasis on threat management.
- Advisor on behavioral based threat intelligence.

Carnegie Mellon University, SEI/CERT, Pittsburgh, PA, April 2011 – August 2015
Research Scientist

- Lead investigator Culture + Cyber Early Warning Study for IARPA. Study examines cultural similarities of various actor groups that use cyber responses to kinetic events.
- Advisor to DISA (SETA role) in several technical areas including, network security recommendations for monitoring, securing electronic mail and flow data analysis.
- Research various studies for Office of the Secretary of Defense, including Cyber Metrics, Modeling and Simulation, and Cyber Mission Forces Challenges.
- DoD and DHS Network Situational Awareness (NetSA) monitoring requirements. Network security scenarios, architect monitoring and enforcement solutions, quantitative network metrics in NetSA and other network security activities. Security analytics for Computer Network Defense (CND) environments.
- Research topics: 0-day attacks, anomaly detection, cloud security, threat intelligence, and cultural influences on cyber behaviors.
- DoD security activities. Secure software development guidance report. Recommendations on authentication and authorization solutions for pilot project with varying access levels.

Lockheed Martin/The SI, Laurel, MD, January 2011- April 2011

Principal Security Architect

- Designed IA architecture for assured information sharing, incorporating encryption, key management, multi-level security, logging and auditing, and dynamic policy management.
- Introduced and implemented Mission Oriented Risk Design Analysis (MORDA); used MORDA fundamental steps for risk analysis.
- IR&D IA Project Leader: Led a project focused on data re-grading. Focused on initial document classification guidelines and re-grading guidelines for existing documents.
- IA Architect for the Content Based Information Security (CBIS) project.