Criminal Investigations and Network Analysis
A DHS CENTER OF EXCELLENCE

GEORGE MASON UNIVERSITY

June 2023 www.cina.gmu.edu

THOUGHTS FROM THE DIRECTOR



Jim Jones

As I write these thoughts, we are winding up our 2023 CINA MSI Week (details in the article below). By all accounts, the week was a huge success, and I am grateful to the CINA team and all of our researchers and colleagues at DHS for their efforts and support. Dr. Joe Rogers, CINA's Workforce and Development Lead, led the development and execution of the event and I am especially grateful for his expertise and commitment to providing a meaningful and enjoyable week.

At MSI Week and on several occasions recently I was asked about my career path or had the opportunity to hear someone else explain their own, and some common themes emerged. First, figure out what you really enjoy doing or want to do, pursue it with every ounce of your energy, and don't let anyone talk you out of it. The result will be, as one colleague put it, disbelief that you are actually being paid for what you do. Second, consider the reason for your work; several colleagues recently expressed deep satisfaction that their work made the world safer or better is some way. They acknowledged that their individual contribution was small, but that great results are usually the product of combined effort by many individuals over time, and each plays a critical role in the eventual success. Finally, on a personal note, I have changed jobs on an irregular but frequent basis in a 35+ year career, and I am finally able to summarize my job choice process: do interesting and hard things that matter. This simple statement has guided my career, which has been neither smooth nor predictable nor without setbacks, but it has been exciting and rewarding. I am able to end each day pleased by what I did and what I am a part of. If I haven't lost you by this point, then please allow me to explain that I share the above not because you asked for career advice (most of you didn't), but because I increasingly meet similarly minded people that inspire and motivate me - they chase their passion and sometimes sacrifice personal and financial comfort for it, but they are uniformly happy.

Read more

NEWS

CINA Welcomes New Transition and Impact Manager



The CINA team recently welcomed Stephen Self to support the center in transitioning CINA research projects to operational integration at DHS, as well as licensing, commercialization, publication and other distribution of research project output.

Prior to joining the CINA center, he worked as a Senior Strategy Analyst for the Defense Threat Reduction Agency.

Self holds a B.A. in Cognitive Science from Pennsylvania State University, an M.A. from St. John's College Graduate Institute, and MPA's in Homeland Security & Emergency Management and Environmental Policy, Management & Law from University of Colorado.

Stephen is a certified Project Management Professional (PMP), and his areas of expertise are focused homeland security and emergency management programs.

Learn more about our CINA Team

CINA Recruits Joe Rogers as Workforce Development Lead



CINA recently brought on Joe Rogers to head Workforce Development for the center.

In his last role he served as a Senior Intelligence Officer (GS15) at the National Counterterrorism Center (NCTC) and provided analyses of terrorist tactics which directly led to force protection and security changes at U.S. facilities worldwide.

Rogers holds a B.A. from George Mason University, a Ph.D. in International Relations, Florida International University, and an M.A. (Legal) from the University of Florida.

RESEARCH

Understanding Cryptomixing Services in Context of the Open and Dark Web

The internet has become a popular marketplace for the sale of illicit products, including stolen personal information, drugs, and firearms. Many of these products are purchased using cryptocurrencies, and several service providers have begun to offer cryptomixing services, which effectively launders payments to circumvent detection and investigation tools.

CINA researchers Dr. Tom Holt (Michigan State University) and Dr. Olga Smirnova (East Carolina University), co-investigators of an ongoing CINA project "Understanding the Economy and Social Organization of the Underground Market for Cybercrime as a Service," recently shared findings on a sample of cryptomixing services advertised on both the open and dark web to better understand cryptomixing and its role in facilitating illicit transactions in various contexts.

Watch the Presentation

Research Findings: "Targeting Investment to Maximize Public Safety Along Residential Street Segments"

In case you missed it, watch the recent presentation that provide updates on research findings from an active CINA project, "Innovative Spatiotemporal Pattern Detection: Examining Changes in Crime Hot Spots Across 6 U.S. Cities," led by Marie Tillyer (University of Texas San Antonio), Rebecca Walter, and Arthur Acolin (University of Washington).

This presentation explores how neighborhood characteristics impact the effects of investment on crime at residential street segments by using data from six large U.S. cities (Chicago, Los Angeles, New York City, Philadelphia, San Antonio, and Seattle) over an 11-year period (2008-2018) to better understand how investment strategies can be targeted to maximize public safety benefits.



Project Spotlight: Time Series Analysis of Anonymized Communication Channels, AKA "Find me if you can"

How do we stop bad actors and transnational criminals? Just ask Professors Bob Simon and Eric Osterweil (George Mason University). Simon and Osterweil have made innovative developments in time-series processing techniques to analyze anonymized and encrypted network traffic leveraging leakages from DNS (Domain Name System) traffic.

Globally available privacy preserving technologies (PPTs) such as Tor can protect both user identity and user data from being revealed to third parties. While PPTs are often used for legitimate purposes, such as evading repressive regimes, well-organized transnational criminals and terrorist enterprises also take advantage of these powerful tools to communicate anonymously.

Using simulated and proxy data sets, Simon and Osterweil have developed tools and methodologies to identify collaborating groups of highly sophisticated transnational criminals that use these anonymous communication networks to coordinate their activities. By analyzing re-occurring behaviors and patterns within these networks, these methodologies will help Homeland Security investigators discover and expose criminal network actors and activities.

Learn more about their research

New findings: Investigating Control Logic Attacks in Industrial Control Systems



A CINA research team led by Dr. Irfan Ahmed (Virginia Commonwealth University) has two new publications based on an ongoing project that helps Industrial Control Systems owners and operators develop a better understanding of anti-forensic aided control logic modification attacks.

In their recent work, Ahmed and his student researchers discuss return oriented programming attacks on programmable logic controllers (PLCs) and how some design features of PLCs can make them vulnerable to potential attacks. The team analyses these features and attacks, and suggests security requirements for designing a PLC.

WORKFORCE DEVELOPMENT

CINA MSI week: Students from across the country learn from the experts at Mason's CINA Center



This week the Criminal Investigations and Network Analysis (CINA) DHS Center of Excellence hosted its fifth annual MSI Week program, hosting students and faculty researchers on both George Mason University's Fairfax, Arlington, and Manassas, VA campuses for a full agenda of workshops, talks, tours, and networking with researchers, program directors, and center and DHS leadership.

Participants actively engaged in face-to-face briefings with experts in forensic science, machine learning methods, drone digital forensics, human trafficking, and learned about DHS Science and Technology program offerings and the missions of other DHS Centers of Excellence.

In addition to a full agenda, the students and faculty from Morgan State University, St. Mary's University, Sul Ross University, Texas A&M Kingsville, University of New Mexico, and the University of North Texas were also involved in a workshop focusing on Network Forensics of Industrial Control Systems, and a Q&A session with DHS S&T Chief Scientist, Dr. Sam Howerton.

To learn more about CINA's student and faculty enrichment and training partnership opportunities, contact CINA Workforce Development and Education Program Director, Joseph Rogers at jroger17@gmu.edu.

Learn more about MSI Programs



Archives - CINA Distinguished Speaker Series

In case you missed it, watch our recent Distinguished Speaker Series presentation with Joe Weiss, Managing Director at Applied Control Solutions, LLC as he discusses “Control System Cyber Security is More than Network Cyber Security.”



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