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\$27M Research Funding

19 H-Index

120 Research Articles

Research Interests

Software and Hardware Protection
Systems Exploitation and Assurance

Malware and Anomaly Detection
Applied Machine Learning

Predictive Analytics
Cyber-Risk Assessment

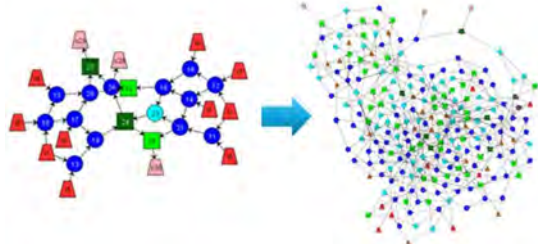
Technological Capabilities

Malware Threat Analytics
Phase Space Analysis

SW Vulnerability Detection
Hardware Assurance

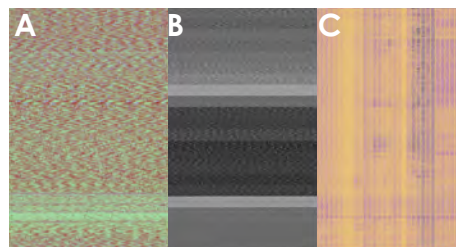
Risk Assessment Frameworks
Biomedical Event Prediction

Hardware/Circuit Protection



(Above) Component encryption transformation visualized using Program Encryption Toolkit (PET). PET can be used to teach a wide range of digital logic concepts as well as for advanced HW obfuscation experiments.

(Below) Example biomedical images (heart signals and brainwaves) used for Machine Learning Classification. (a) 1-Channel EKG; (b) 1-Channel EKG Phase Space Links; (c) 32-channel EEG.



Biomedical Event Detection Using AI/ML

NonLinear Phase Space Analysis



(Above) Phase space graphs are created from time-series data like power readings, brainwaves, or network traffic. Graph difference is used to indicate state change like malware execution, organ failure, or disorder.

2012
Communication and Information Systems Security Symposium
"Evaluating Component Hiding Techniques in Circuit Technologies"

2019
Journal of Computational Neuroscience
"Predicting State Transitions in Brain Dynamics Through Spectral Distance of Phase Space Graphs"

2018
Journal of Computer Security
"Identifying Stealth Malware Using CPU Power Consumption and Learning Algorithms"

2021
Springer Communications in Computer and Information Science
"Evaluating Defensive Countermeasures for Software-Based Hardware Abstraction"



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