# Contents

Towards Fundamental Science of Cyber Security .......................... 1
Alexander Kott

Bridging the Semantic Gap: Human Factors in Anomaly-Based Intrusion Detection Systems. .......................... 15
Richard Harang

Recognizing Unexplained Behavior in Network Traffic ................. 39
Massimiliano Albanese, Robert F. Erbacher, Sushil Jajodia,
C. Molinaro, Fabio Persia, Antonio Picariello, Giancarlo Sperli
and V. S. Subrahmanian

Applying Cognitive Memory to CyberSecurity .......................... 63
Bruce McCormick

Understanding Cyber Warfare ................................................ 75
Yan M. Yufik

Design of Neuromorphic Architectures with Memristors. ........... 93
Dhireesha Kudithipudi, Cory Merkel, Mike Soltiz, Garrett S. Rose
and Robinson E. Pino

Nanoelectronics and Hardware Security ................................. 105
Garrett S. Rose, Dhireesha Kudithipudi, Ganesh Khedkar,
Nathan McDonald, Bryant Wysocki and Lok-Kwong Yan

User Classification and Authentication for Mobile Device Based on Gesture Recognition .......................... 125
Kent W. Nixon, Yiran Chen, Zhi-Hong Mao and Kang Li
Hardware-Based Computational Intelligence for Size, Weight, and Power Constrained Environments ...................... 137
Bryant Wysocki, Nathan McDonald, Clare Thiem, Garrett Rose and Mario Gomez II

Machine Learning Applied to Cyber Operations ............... 155
Misty Blowers and Jonathan Williams

Detecting Kernel Control-Flow Modifying Rootkits .......... 177
Xueyang Wang and Ramesh Karri

Formation of Artificial and Natural Intelligence in Big Data Environment ............................................................. 189
Simon Berkovich

Alert Data Aggregation and Transmission Prioritization over Mobile Networks ......................................................... 205
Hasan Cam, Pierre A. Mouallem and Robinson E. Pino

Semantic Features from Web-Traffic Streams .................. 221
Steve Hutchinson

Concurrent Learning Algorithm and the Importance Map ........ 239
M. R. McLean

Hardware Accelerated Mining of Domain Knowledge .......... 251
Tanvir Atahary, Scott Douglass and Tarek M. Taha

Memristors and the Future of Cyber Security Hardware ....... 273
Michael J. Shevenell, Justin L. Shumaker and Robinson E. Pino
Network Science and Cybersecurity
Pino, R.E. (Ed.)
2014, X, 285 p., Hardcover