Introduction To Cyberdeception

The foundational guide for using deception against computer network adversaries.When an attacker breaks into your network, you have a home-field advantage. But how do you use it?Intrusion Detection Honeypots is the foundational guide to building, deploying, and monitoring honeypots -- security resources whose value lies in being probed and attacked. These fake systems, services, and tokens lure attackers in, enticing them to interact. Unbeknownst to the attacker, those interactions generate logs that alert you to their presence and educate you about their tradecraft. Intrusion Detection Honeypots teaches you how to: Use the See-Think-Do framework to integrate honeypots into your network and lure attackers into your traps, leverage honey services that mimic HTTP, SSH, and RDP, hide honey tokens amongst legitimate documents, files, and folders, entice attackers to use fake credentials that give them away, create honey commands, honey tables, honey broadcasts, and other unique detection tools that leverage deception, and monitor honeypots for interaction and investigate the logs they generate.With the techniques in this book, you can safely use honeypots inside your network to detect adversaries before they accomplish their goals.

Recently, network traffic analysis and cyber deception have been increasingly used in various applications to protect people, information, and systems from major cyber threats. Network traffic fingerprinting is a traffic analysis attack which threatens web navigation privacy. It is a set of techniques used to discover patterns from a sequence of network packets generated while a user accesses different websites. Internet users (such as online activists or journalists) may wish to hide their identity and online activity to protect their privacy. Typically, an anonymity network is utilized for this purpose. These anonymity networks such as Tor (The Onion Router) provide layers of data encryption which poses a challenge to the traffic analysis techniques. Traffic fingerprinting studies have employed various traffic analysis and statistical techniques over anonymity networks. Most studies use a similar set of features including packet size, packet direction, total count of packets, and other summaries of different packets. Moreover, various defense mechanisms have been proposed to counteract these feature selection processes, thereby reducing prediction accuracy. In this dissertation, we address the aforementioned challenges and present a novel method to extract characteristics from encrypted traffic by utilizing data dependencies that occur over sequential transmissions of network packets. In addition, we explore the temporal nature of encrypted traffic and introduce an adaptive model that considers changes in data content over time. We not only consider traditional learning techniques for prediction, but also use semantic vector space models (VSMs) of language where each word (packet) is represented as a real-valued vector. We also introduce a novel defense algorithm to counter the traffic fingerprinting attack. The defense uses sampling and mathematical optimization techniques to morph packet sequences and destroy traffic flow dependency patterns. Cyber deception has been shown to be a key ingredient in cyber warfare. Cyber security deception is the methodology followed by an organization to lure the adversary into a controlled and transparent environment for the purpose of protecting the organization, disinforming the attacker, and discovering zero-day threats. We extend our traffic fingerprinting work to the cyber deception domain and leverage recent advances in software deception to enhance Intrusion Detection Systems by feeding back attack traces into machine learning classifiers. We present a feature-rich attack classification approach to extract security-relevant network-and system-level characteristics from production servers hosting enterprise web applications.

There is little doubt that cyber-space has become the battle space for confrontations. However, to conduct cyber operations, a new armory of weapons needs to be employed. No matter how many, or how sophisticated an aggressor’s kinetic weapons are, they are useless in cyber-space. This book looks at the milieu of the cyber weapons industry, as well as the belligerents who use cyber weapons. It discusses what distinguishes these hardware devices and software programs from computer science in general. It does this by focusing on specific aspects of the topic—contextual issues of why cyber-space is the new battleground, defensive cyber weapons, offensive cyber weapons, dual-use weapons, and the implications these weapons systems have for practice. Contrary to popular opinion, the use of cyber weapons is not limited to nation states; though this is where the bulk of news reporting focuses. The reality is that there isn’t a sector of the political-economy that is immune to cyber skirmishes. So, this book looks at cyber weapons not only by national security agencies and the military, but also by law enforcement, and the business sector—the latter includes administrations termed non-government organisations (NGOs). This book offers study material suitable for a wide-ranging audience—students, professionals, researchers, policy officers, and ICT specialists.

In-depth counterintelligence tactics to fight cyber-espionage "A comprehensive and unparalleled overview of the topic by experts in the field."--Slashdot Expose, pursue, and prosecute the perpetrators of advanced persistent threats (APTs) using the tested security techniques and real-world case studies featured in this one-of-a-kind guide. Reverse Deception: Organized Cyber Threat Counter-Exploitation shows how to assess your network’s vulnerabilities, zero in on targets, and effectively block intruders. Discover how to set up digital traps, misdirect and divert attackers, configure honeypots, mitigate encrypted crimeware, and identify malicious software groups. The expert authors provide full coverage of legal and ethical issues, operational vetting, and security team management. Establish the goals and scope of your reverse deception campaign Identify, analyze, and block APTs Engage and catch nefarious individuals and their organizations Assemble cyber-profiles, incident analyses, and intelligence reports Uncover, eliminate, and autopsy crimeware, trojans, and botnets Work with intrusion detection, anti-virus, and digital forensics tools Employ stealth honeynet, honeypot, and sandbox technologies Communicate and collaborate with legal teams and law enforcement

This book constitutes the refereed proceedings of the 12th International Conference on Decision and Game Theory for Security, GameSec 2021,held in October 2021. Due to COVID-19 pandemic the conference was held virtually. The 20 full papers presented were carefully reviewed and selected from 37 submissions. The papers focus on Theoretical Foundations in Equilibrium Computation; Machine Learning and Game Theory; Ransomware; Cyber-

Physical Systems Security; Innovations in Attacks and Defenses.

This textbook surveys the knowledge base in automated and resilient cyber deception. It features four major parts: cyber deception reasoning frameworks, dynamic decision-making for cyber deception, network-based deception, and malware deception. An important distinguishing characteristic of this book is its inclusion of student exercises at the end of each chapter. Exercises include technical problems, short-answer discussion questions, or hands-on lab exercises, organized at a range of difficulties from easy to advanced,. This is a useful textbook for a wide range of classes and degree levels within the security arena and other related topics. It’s also suitable for researchers and practitioners with a variety of cyber security backgrounds from novice to experienced.

This edited volume features a wide spectrum of the latest computer science research relating to cyber deception. Specifically, it features work from the areas of artificial intelligence, game theory, programming languages, graph theory, and more. The work presented in this book highlights the complex and multi-facted aspects of cyber deception, identifies the new scientific problems that will emerge in the domain as a result of the complexity, and presents novel approaches to these problems. This book can be used as a text for a graduate-level survey/seminar course on cutting-edge computer science research relating to cyber-security, or as a supplemental text for a regular graduate-level course on cyber-security.

"The chapters on the exercises are a treasure chest of material to work with, covering a whole array of scenarios. . . . I think virtually every page and topic could spark robust and spirited classroom discussion starting with the text title itself." —Ronald W. Vardy, University of Houston "Most students have very little or no background [in this subject area], so Clark’s work is great to introduce students to intelligence and the analytical disciplines . . . a really excellent book that fills a gaping hole in the public literature and is of genuinely great value to both students and practitioners." —Carl A. Wege, Professor Emeritus, College of Coastal Georgia Bridging the divide between theory and practice, Deception: Counterdeception and Counterintelligence provides a thorough overview of the principles of deception and its uses in intelligence operations. This masterful guide focuses on practical training in deception for both operational planners and intelligence analysts using a case-based approach. Authors Robert M. Clark and William L. Mitchell draw from years of professional experience to offer a fresh approach to the roles played by information technologies such as social media. By reading and working through the exercises in this text, operations planners will learn how to build and conduct a deception campaign, and intelligence analysts will develop the ability to recognize deception and support deception campaigns. Key Features New channels for deception, such as social media, are explored to show readers how to conduct and detect deception activities through information technology. Multichannel deception across the political, military, economic, social, infrastructure, and information domains provides readers with insight into the variety of ways deception can be used as an instrument for gaining advantage in conflict. Contemporary and historical cases simulate real-world raw intelligence and provide readers with opportunities to use theory to create a successful deception operation. A series of practical exercises encourages students to think critically about each situation. The exercises have several possible answers, and conflicting raw material is designed to lead readers to different answers depending on how the reader evaluates the material. Individual and team assignments offer instructors the flexibility to proceed through the exercises in any order and assign exercises based on what works best for the classroom setup.

This book explores fundamental scientific problems essential for autonomous cyber defense. Specific areas include: Game and control theory-based moving target defenses (MTDs) and adaptive cyber defenses (ACDs) for fully autonomous cyber operations; The extent to which autonomous cyber systems can be designed and operated in a framework that is significantly different from the human-based systems we now operate; On-line learning algorithms, including deep recurrent networks and reinforcement learning, for the kinds of situation awareness and decisions that autonomous cyber systems will require; Human understanding and control of highly distributed autonomous cyber defenses; Quantitative performance metrics for the above so that autonomous cyber defensive agents can reason about the situation and appropriate responses as well as allowing humans to assess and improve the autonomous system. This book establishes scientific foundations for adaptive autonomous cyber systems and ultimately brings about a more secure and reliable Internet. The recent advances in adaptive cyber defense (ACD) have developed a range of new ACD techniques and methodologies for reasoning in an adaptive environment. Autonomy in physical and cyber systems promises to revolutionize cyber operations. The ability of autonomous systems to execute at scales, scopes, and tempos exceeding those of humans and human-controlled systems will introduce entirely new types of cyber defense strategies and tactics, especially in highly contested physical and cyber environments. The development and automation of cyber strategies that are responsive to autonomous adversaries pose basic new technical challenges for cyber-security. This book targets cyber-security professionals and researchers (industry, governments, and military). Advanced-level students in computer science and information systems will also find this book useful as a secondary textbook.

With millions lost each year, cyber crime has evolved from a minor nuisance to a major concern involving well-organized actors and highly sophisticated organizations. Combining the best of investigative journalism and technical analysis, Cyber Fraud: Tactics, Techniques, and Procedures documents changes in the culture of cyber criminals and explores the innovations that are the result of those changes. The book uses the term Botnet as a metaphor for the evolving changes represented by this underground economy. Copiously illustrated, this engaging and engrossing book explores the state of threats present in the cyber fraud underground. It discusses phishing and pharming, trojans and toolkits, direct threats, pump-and-dump scams, and other fraud-related activities of the booming cyber-underground economy. By examining the geopolitical and socio-economic foundations of a cyber threat landscape, the book specifically examines telecommunications infrastructure development, patterns and trends of internet adoption and use, profiles of specific malicious actors, threat types, and trends in these areas. This eye-opening work includes a variety of case studies ? including the cyber threat landscape in Russia and Brazil. An in-depth discussion is provided on the Russian Business Network's (RBN) role in global cyber crime as well as new evidence on how these criminals steal, package, buy, sell, and profit from the personal financial information of consumers. Armed with this invaluable information, organizations and individuals will be better able to secure their systems and develop countermeasures to disrupt underground fraud.

The 28 revised full papers presented together with 8 short papers were carefully reviewed and selected from 44 submissions.Among the topical areas covered were: use of game theory; control theory; and mechanism design for security and privacy; decision making for cybersecurity and security requirements engineering; security and privacy for the Internet-of-Things; cyber-physical systems; cloud computing; resilient control systems, and critical infrastructure; pricing; economic incentives; security investments, and cyber insurance for dependable and secure systems; risk assessment and security risk management; security and privacy of wireless and mobile communications, including user location privacy; sociotechnological and behavioral approaches to security; deceptive technologies in cybersecurity and privacy; empirical and experimental studies with game, control, or optimization theory-based analysis for security and privacy; and adversarial machine learning and crowdsourcing, and the role of artificial intelligence in system security.

Deception in the Digital Age: Exploiting and Defending Human Targets Through Computer-Mediated Communication guides readers through the fascinating history and principles of deception—and how these techniques and stratagems are now being effectively used by cyber attackers. Users will find an in-depth guide that provides valuable insights into the cognitive, sensory and narrative bases of misdirection, used to shape the targeted audience's perceptions and beliefs. The text provides a detailed analysis of the psychological, sensory, sociological, and technical precepts that reveal predictors of attacks—and conversely postmortem insight about attackers—presenting a unique resource that empowers readers to observe, understand and protect against cyber deception tactics. Written by information security experts with real-world investigative experience, the text is the most instructional book available on the subject, providing practical guidance to readers with rich literature references, diagrams and examples that enhance the learning process. Deeply examines the psychology of deception through the lens of misdirection and other techniques used by master magicians Explores cognitive vulnerabilities that cyber attackers use to exploit human targets Dissects the underpinnings and elements of deception narratives Examines group dynamics and deception factors in cyber attacker underground markets Provides deep coverage on how cyber attackers leverage psychological influence techniques in the trajectory of deception strategies Explores the deception strategies used in today’s threat landscape—phishing, watering hole, scareware and ransomware attacks Gives unprecedented insight into deceptive Internet video communications Delves into the history and deception pathways of nation-state and cyber terrorism attackers Provides unique insight into honeypot technologies and strategies Explores the future of cyber deception

This book introduces various machine learning methods for cyber security analytics. With an overwhelming amount of data being generated and transferred over various networks, monitoring everything that is exchanged and identifying potential cyber threats and attacks poses a serious challenge for cyber experts. Further, as cyber attacks become more frequent and sophisticated, there is a requirement for machines to predict, detect, and identify them more rapidly. Machine learning offers various tools and techniques to automate and quickly predict, detect, and identify cyber attacks.

Research Methods for Cyber Security teaches scientific methods for generating impactful knowledge, validating theories, and adding critical rigor to the cyber security field. This book shows how to develop a research plan, beginning by starting research with a question, then offers an introduction to the broad range of useful research methods for cyber security research: observational, mathematical, experimental, and applied. Each research method chapter concludes with recommended outlines and suggested templates for submission to peer reviewed venues. This book concludes with information on cross-cutting issues within cyber security research. Cyber security research contends with numerous unique issues, such as an extremely fast environment evolution, adversarial behavior, and the merging of natural and social science phenomena. Research Methods for Cyber Security addresses these concerns and much more by teaching readers not only the process of science in the context of cyber security research, but providing assistance in execution of research as well. Presents research methods from a cyber security science perspective Catalyzes the rigorous research necessary to propel the cyber security field forward Provides a guided method selection for the type of research being conducted, presented in the context of real-world usage

Crime is undergoing a metamorphosis. The online technological revolution has created new opportunities for a wide variety of crimes which can be perpetrated on an industrial scale, and crimes traditionally committed in an offline environment are increasingly being transitioned to an online environment. This book takes a case study-based approach to exploring the types, perpetrators and victims of cyber frauds. Topics covered include: An in-depth breakdown of the most common types of cyber fraud and scams. The victim selection techniques and perpetration strategies of fraudsters. An exploration of the impact of fraud upon victims and best practice examples of support systems for victims. Current approaches for policing, punishing and preventing cyber frauds and scams. This book argues for a greater need to understand and respond to cyber fraud and scams in a more effective and victim-centred manner. It explores the victim-blaming discourse, before moving on to examine the structures of support in place to assist victims, noting some of the interesting initiatives from around the world and the emerging strategies to counter this problem. This book is essential reading for students and researchers engaged in cyber crime, victimology and international fraud.

Introduction to Network Simulator NS2 is a primer providing materials for NS2 beginners, whether students, professors, or researchers for understanding the architecture of Network Simulator 2 (NS2) and for incorporating simulation modules into NS2. The authors discuss the simulation architecture and the key components of NS2 including simulation-related objects, network objects, packet-related objects, and helper objects. The NS2 modules included within are nodes, links, SimpleLink objects, packets, agents, and applications. Further, the book covers three helper modules: timers, random number generators, and error models. Also included are chapters on summary of debugging, variable and packet tracing, result compilation, and examples for extending NS2. Two appendices provide the details of scripting language Tcl, OTcl and AWK, as well object oriented programming used extensively in NS2. This book is an introduction to both offensive and defensive techniques of cyberdeception. Unlike most books on cyberdeception, this book focuses on methods rather than detection. It treats cyberdeception techniques that are current, novel, and practical, and that go well beyond traditional honeypots. It contains features friendly for classroom use: (1) minimal use of programming details and mathematics, (2) modular chapters that can be covered in many orders, (3) exercises with each chapter, and (4) an extensive reference list.Cyberattacks have grown serious enough that understanding and using deception is essential to safe operation in cyberspace. The deception techniques covered are impersonation, delays, fakes, camouflage, false excuses, and social engineering. Special attention is devoted to cyberdeception in industrial control systems and within operating systems. This material is supported by a detailed discussion of how to plan deceptions and calculate their detectability and effectiveness. Some of the chapters provide further technical details of specific deception techniques and their application. Cyberdeception can be conducted ethically and efficiently when necessary by following a few basic principles. This book is intended for advanced undergraduate students and graduate students, as well as computer professionals learning on their own. It will be especially useful for anyone who helps run important and essential computer systems such as critical-infrastructure and military systems.

Master cutting-edge techniques and countermeasures to protect your organization from live hackers. Learn how to harness cyber deception in your operations to gain an edge over the competition. Key Features Gain an advantage against live hackers in a competition or real computing environment Understand advanced red team and blue team techniques with code examples Learn to battle in short-term memory, whether remaining unseen (red teams) or monitoring an attacker's traffic (blue teams) Book Description Little has been written about what to do when live hackers are on your system and running amok. Even experienced hackers tend to choke up when they realize the network defender has caught them and is zoning in on their implants in real time. This book will provide tips and tricks all along the kill chain of an attack, showing where hackers can have the upper hand in a live conflict and how defenders can outsmart them in this adversarial game of computer cat and mouse. This book contains two subsections in each chapter, specifically focusing on the offensive and defensive teams. It begins by introducing you to adversarial operations and principles of computer conflict where you will explore the core principles of deception, humanity, economy, and more about human-on-human conflicts. Additionally, you will understand everything from planning to setting up infrastructure and tooling that both sides should have in place. Throughout this book, you will learn how to gain an advantage over opponents by disappearing from what they can detect. You will further understand how to blend in, uncover other actors' motivations and means, and learn to tamper with them to hinder their ability to detect your presence. Finally, you will learn how to gain an advantage through advanced research and thoughtfully concluding an operation. By the end of this book, you will have achieved a solid understanding of cyberattacks from both an attacker's and a defender's perspective. What you will learn Understand how to implement process injection and how to detect it Turn the tables on the offense with active defense Disappear on the defender's system, by tampering with defensive sensors Upskill in using deception with your backdoors and countermeasures including honeypots Kick someone else from a computer you are on and gain the upper hand Adopt a language agnostic approach to become familiar with techniques that can be applied to both the red and blue teams Prepare yourself for real-time cybersecurity conflict by using some of the best techniques currently in the industry Who this book is for Pentesters to red teamers, security operations center analysts to incident responders, attackers, defenders, general hackers, advanced computer users, and security engineers should gain a lot from this book. This book will also be beneficial to those getting into purple teaming or adversarial simulations, as it includes processes for gaining an advantage over the other team. Basic knowledge of Python programming, Go programming, Bash, PowerShell, and systems administration is desirable. Furthermore, knowledge of incident response and Linux is beneficial. Prior exposure to cybersecurity, penetration testing, and ethical hacking basics is desirable.

This book introduces game theory as a means to conceptualize, model, and analyze cyber deception. Drawing upon a collection of deception research from the past 10 years, the authors develop a taxonomy of six species of defensive cyber deception. Three of these six species are highlighted in the context of emerging problems such as privacy against ubiquitous tracking in the Internet of things (IoT), dynamic honeynets for the observation of advanced persistent threats (APTs), and active defense against physical denial-of-service (PDoS) attacks. Because of its uniquely thorough treatment of cyber deception, this book will serve as a timely contribution and valuable resource in this active field. The opening chapters introduce both cybersecurity in a manner suitable for game theorists and game theory as appropriate for cybersecurity professionals. Chapter Four then guides readers through the specific field of defensive cyber deception. A key feature of the remaining chapters is the development of a signaling game model for the species of leaky deception featured in honeypots and honeyfiles. This model is expanded to study interactions between multiple agents with varying abilities to detect deception. Game Theory for Cyber Deception will appeal to advanced undergraduates, graduate students, and researchers interested in applying game theory to cybersecurity. It will also be of value to researchers and professionals working on cybersecurity who seek an introduction to game theory.

Most of us can recall a time when we pretended to be sick to reap the benefits that go along with illness. By playing sick, we gained sympathy, care, and attention, and were excused from our responsibilities. Though doing so on occasion is considered normal, there are those who carry their deceptions to the extreme. In this book, Dr. Marc Feldman describes people’s strange motivations to fabricate or induce illness or injury to satisfy deep emotional needs. Doctors, family members, and friends are lured into a costly, frustrating, and potentially deadly web of deceit. From the mother who shaves her child’s head and tells her community he has cancer, to the co-worker who suffers from a string of incomprehensible "tragedies," to the false epilepsy victim who monopolizes her online support group, "disease forgery" is ever-present in the media and in many people’s lives. In Dying to be Ill: True Stories of Medical Deception, Dr. Feldman, with the assistance of Gregory Yates, has chronicled this fascinating world as well as the paths to healing. With insight developed from 25 years of hands-on experience, Dying to be Ill is sure to stand as a classic in the field.

We depend on information and information technology (IT) to make many of our day-to-day tasks easier and more convenient. Computers play key roles in transportation, health care, banking, and energy. Businesses use IT for payroll and accounting, inventory and sales, and research and development. Modern military forces use weapons that are increasingly coordinated through computer-based networks. Cybersecurity is vital to protecting all of these functions. Cyberspace is vulnerable to a broad spectrum of hackers, criminals, terrorists, and state actors. Working in cyberspace, these malevolent actors can steal money, intellectual property, or classified information; impersonate law-abiding parties for their own purposes; damage important data; or deny the availability of normally accessible services. Cybersecurity issues arise because of three factors taken together - the presence of malevolent actors in cyberspace, societal reliance on IT for many important functions, and the presence of vulnerabilities in IT systems. What steps can policy makers take to protect our government, businesses, and the public from those would take advantage of system vulnerabilities? At the Nexus of Cybersecurity and Public Policy offers a wealth of information on practical measures, technical and nontechnical challenges, and potential policy responses. According to this report, cybersecurity is a never-ending battle; threats will evolve as adversaries adopt new tools and techniques to compromise security. Cybersecurity is therefore an ongoing process that needs to evolve as new threats are identified. At the Nexus of Cybersecurity and Public Policy is a call for action to make cybersecurity a public safety priority. For a number of years, the cybersecurity issue has received increasing public attention; however, most policy focus has been on the short-term costs of improving systems. In its explanation of the fundamentals of cybersecurity and the discussion of potential policy responses, this book will be a resource for policy makers, cybersecurity and IT professionals, and anyone who wants to understand threats to cyberspace.

This book features a wide spectrum of the latest computer science research relating to cyber warfare, including military and policy dimensions. It is the first book to explore the scientific foundation of cyber warfare and features research from the areas of artificial intelligence, game theory, programming languages, graph theory and more. The high-level approach and emphasis on scientific rigor provides insights on ways to improve cyber warfare defense worldwide. Cyber Warfare: Building the Scientific Foundation targets researchers and practitioners working in cyber security, especially government employees or contractors. Advanced-level students in computer science and electrical engineering with an interest in security will also find this content valuable as a secondary textbook or reference.

In today's Africa racism and ethnicity have been implicated in serious conflicts - from Egypt to Mali to South Africa - that have cost lives and undermined efforts to achieve national cohesion and meaningful development. Racism, Ethnicity and the Media in Africa sets about rethinking the role of media and communication in perpetuating, reinforcing and reining in racism, absolute ethnicity and other discriminations across Africa. It goes beyond the customary discussion of media racism and ethnic stereotyping to critically address broader issues of identity, belonging and exclusion. Topics covered include racism in South African newspapers, pluralist media debates in Kenya, media discourses on same-sex relations in Uganda and ethnicised news coverage in Nigerian newspapers.

This book provides a comprehensive overview of the key concerns as well as research challenges in designing secure and resilient Industrial Control Systems (ICS). It will discuss today's state of the art security architectures and couple it with near and long term research needs that compare to the baseline. It will also establish all discussions to generic reference architecture for ICS that reflects and protects high consequence scenarios. Significant strides have been made in making industrial control systems secure. However, increasing connectivity of ICS systems with commodity IT devices and significant human interaction of ICS systems during its operation regularly introduces newer threats to these systems resulting in ICS security defenses always playing catch-up. There is an emerging consensus that it is very important for ICS missions to survive cyber-attacks as well as failures and continue to maintain a certain level and quality of service. Such resilient ICS design requires one to be proactive in understanding and reasoning about evolving threats to ICS components, their potential effects on the ICS mission’s survivability goals, and identify ways to design secure resilient ICS systems. This book targets primarily educators and researchers working in the area of ICS and Supervisory Control And Data Acquisition (SCADA) systems security and resiliency. Practitioners responsible for security deployment, management and governance in ICS and SCADA systems would also find this book useful. Graduate students will find this book to be a good starting point for research in this area and a reference source.

This book constitutes the thoroughly refereed post-conference proceedings of the 20th International Conference on Information Security Applications, WISA 2019, held on Jeju Island, South Korea, in August 2019. The 29 revised full papers presented in this volume were carefully reviewed and selected from 63 submissions. The primary focus of WISA 2019 was on systems and network security including all other technical and practical aspects of security application in general. The papers are grouped in the following topical sections: Application and Game Security; Network Security and Blockchain; Cryptography; Security with AI and Machine Learning; IoT Security; Hardware Security; and Selected Security Issues.

This book constitutes the refereed proceedings of the 8th International Conference on Decision and Game Theory for Security, GameSec 2017, held in Vienna, Austria, in October 2017. The 24 revised full papers presented together with 4 short papers were carefully reviewed and selected from 71 submissions.The papers address topics such as Game theory and mechanism design for security and privacy; Pricing and economic incentives for building dependable and secure systems; Dynamic control, learning, and optimization and approximation techniques; Decision making and decision theory for cybersecurity and security requirements engineering; Socio-technological and behavioral approaches to security; Risk assessment and risk management; Security investment and cyber insurance; Security and privacy for the Internet-of-Things (IoT), cyber-physical systems, resilient control systems; New approaches for security and privacy in cloud computing and for critical infrastructure; Security and privacy of wireless and mobile communications, including user location privacy; Game theory for intrusion detection; and Empirical and experimental studies with game-theoretic or optimization analysis for security and privacy. This book presents the first reference exposition of the Cyber-Deception Chain: a flexible planning and execution framework for creating tactical, operational, or strategic deceptions. This methodology bridges the gap between the current uncoordinated patchwork of tactical denial and deception (D&D) techniques and their orchestration in service of an organization's mission. Concepts for cyber-D&D planning operations and management are detailed within the larger organizational, business, and cyber defense context. It examines the necessity of a comprehensive, active cyber denial scheme. The authors explain the organizational implications of integrating D&D with a legacy cyber strategy, and discuss trade-offs, maturity models, and lifecycle management. Chapters present the primary challenges in using deception as part of a security strategy, and guides users through the steps to overcome common obstacles. Both revealing and concealing fact and fiction have a critical role in securing private information. Detailed case studies are included. Cyber Denial, Deception and Counter Deception is designed as a reference for professionals, researchers and government employees working in cybersecurity. Advanced-level students in computer science focused on security will also find this book useful as a reference or secondary text book.

Cybercrime and Digital Deviance is a work that combines insights from sociology, criminology, and computer science to explore cybercrimes such as hacking and romance scams, along with forms of cyberdeviance such as pornography addiction, trolling, and flaming. Other issues are explored including cybercrime investigations, organized cybercrime, the use of algorithms in policing, cybervictimization, and the theories used to explain cybercrime. Graham and Smith make a conceptual distinction between a terrestrial, physical environment and a single digital environment produced through networked computers. Conceptualizing the online space as a distinct environment for social interaction links this text with assumptions made in the fields of urban sociology or rural criminology. Students in sociology and criminology will have a familiar entry point for understanding what may appear to be a technologically complex course of study. The authors organize all forms of cybercrime and cyberdeviance by applying a typology developed by David Wall: cybertrespass, cyberdeception, cyberviolence, and cyberpornography. This typology is simple enough for students just beginning their inquiry into cybercrime. Because it is based on legal

categories of trespassing, fraud, violent crimes against persons, and moral transgressions it provides a solid foundation for deeper study. Taken together, Graham and Smith’s application of a digital environment and Wall’s cybercrime typology makes this an ideal upper level text for students in sociology and criminal justice. It is also an ideal introductory text for students within the emerging disciplines of cybercrime and cybersecurity.
An essential guide to the modeling and design techniques for securing systems that utilize the Internet of Things Modeling and Design of Secure Internet of Things offers a guide to the underlying foundations of modeling secure Internet of Things' (IoT) techniques. The contributors—noted experts on the topic—also include information on practical design issues that are relevant for application in the commercial and military domains. They also present several attack surfaces in IoT and secure solutions that need to be developed to reach their full potential. The book offers material on security analysis to help with in understanding and quantifying the impact of the new attack surfaces introduced by IoT deployments. The authors explore a wide range of themes including: modeling techniques to secure IoT, game theoretic models, cyber deception models, moving target defense models, adversarial machine learning models in military and commercial domains, and empirical validation of IoT platforms. This important book: Presents

information on game-theory analysis of cyber deception Includes cutting-edge research finding such as IoT in the battlefield, advanced persistent threats, and intelligent and rapid honeynet generation Contains contributions from an international panel of experts Addresses design issues in developing secure IoT including secure SDN-based network orchestration, networked device identity management, multi-domain battlefield settings, and smart cities Written for researchers and experts in computer science and engineering, Modeling and Design of Secure Internet of Things contains expert contributions to provide the most recent modeling and design techniques for securing systems that utilize Internet of Things.

In today?s globalized world, businesses and governments rely heavily on technology for storing and protecting essential information and data. Despite the benefits that computing systems offer, there remains an assortment of issues and challenges in maintaining the integrity and confidentiality of these databases. As professionals become more dependent cyberspace, there is a need for research on modern strategies and concepts for improving the security and safety of these technologies. Modern Theories and Practices for Cyber Ethics and Security Compliance is a collection of innovative research on the concepts, models, issues, challenges, innovations, and mitigation strategies needed to improve cyber protection. While highlighting topics including database governance, cryptography, and intrusion detection, this book provides guidelines for the protection, safety, and security of business data and national infrastructure from cyber-attacks. It is ideally designed for security analysts, law enforcement, researchers, legal practitioners, policymakers, business professionals, governments, strategists, educators, and students seeking current research on combative solutions for cyber threats and attacks.

This book constitutes the refereed proceedings of the 11th International Conference on Decision and Game Theory for Security, GameSec 2020,held in College Park, MD, USA, in October 2020. Due to COVID-19 pandemic the conference was held virtually The 21 full papers presented together with 2 short papers were carefully reviewed and selected from 29 submissions. The papers focus on machine learning and security; cyber deception; cyber-physical systems security; security of network systems; theoretic foundations of security games; emerging topics.

Tired of playing catchup with hackers? Does it ever seem they have all of the cool tools? Does it seem like defending a network is just not fun? This books introduces new cyber-security defensive tactics to annoy attackers, gain attribution and insight on who and where they are. It discusses how to attack attackers in a way which is legal and incredibly useful.

Move beyond the foundations of machine learning and game theory in cyber security to the latest research in this cutting-edge field In Game Theory and Machine Learning for Cyber Security, a team of expert security researchers delivers a collection of central research contributions from both machine learning and game theory applicable to cybersecurity. The distinguished editors have included resources that address open research questions in game theory and machine learning applied to cyber security systems and examine the strengths and limitations of current game theoretic models for cyber security. Readers will explore the vulnerabilities of traditional machine learning algorithms and how they can be mitigated in an adversarial machine learning approach. The book offers a comprehensive suite of solutions to a broad range of technical issues in applying game theory and machine learning to solve cyber security challenges. Beginning with an introduction to foundational concepts in game theory, machine learning, cyber security, and cyber deception, the editors provide readers with resources that discuss the latest in hypergames, behavioral game theory, adversarial machine learning, generative adversarial networks, and multi-agent reinforcement learning. Readers will also enjoy: A thorough introduction to game theory for cyber deception, including scalable algorithms for identifying stealthy attackers in a game theoretic framework, honeypot allocation over attack graphs, and behavioral games for cyber deception An exploration of game theory for cyber security, including actionable game-theoretic adversarial intervention detection against persistent and advanced threats Practical discussions of adversarial machine learning for cyber security, including adversarial machine learning in 5G security and machine learning-driven fault injection in cyber-physical systems In-depth examinations of generative models for cyber security Perfect for researchers, students, and experts in the fields of computer science and engineering, Game Theory and Machine Learning for Cyber Security is also an indispensable resource for industry professionals, military personnel, researchers, faculty, and students with an interest in cyber security.

This two-volume set LNICST 304-305 constitutes the post-conference proceedings of the 15thInternational Conference on Security and Privacy in Communication Networks, SecureComm 2019, held in Orlando, FL, USA, in October 2019. The 38 full and 18 short papers were carefully reviewed and selected from 149 submissions. The papers are organized in topical sections on blockchains, internet of things, machine learning, everything traffic security communicating covertly, let’s talk privacy, deep analysis, systematic theory, bulletproof defenses, blockchains and IoT, security and analytics, machine learning, private, better clouds, ATCS workshop.

Through the rise of big data and the internet of things, terrorist organizations have been freed from geographic and logistical confines and now have more power than ever before to strike the average citizen directly at home. This, coupled with the inherently asymmetrical nature of cyberwarfare, which grants great advantage to the attacker, has created an unprecedented national security risk that both governments and their citizens are woefully ill-prepared to face. Examining cyber warfare and terrorism through a critical and academic perspective can lead to a better understanding of its foundations and implications. Cyber Warfare and Terrorism: Concepts, Methodologies, Tools, and Applications is an essential reference for the latest research on the utilization of online tools by terrorist organizations to communicate with and recruit potential extremists and examines effective countermeasures employed by law enforcement agencies to defend against such threats. Highlighting a range of topics such as cyber threats, digital intelligence, and counterterrorism, this multi-volume book is ideally designed for law enforcement, government officials, lawmakers, security analysts, IT specialists, software developers, intelligence and security practitioners, students, educators, and researchers.

This book constitutes the refereed proceedings of the 10th International Conference on Decision and Game Theory for Security, GameSec 2019,held in Stockholm, Sweden, in October 2019.The 21 full papers presented together with 11 short papers were carefully reviewed and selected from 47 submissions.The papers focus on protection of heterogeneous, large-scale and dynamic cyber-physical systems as well as managing security risks faced by critical infrastructures through rigorous and practically-relevant analytical methods.