Malware Data Science Attack Detection And Attribution

Malware Data Science **Data Science For Cyber-security Statistics and Data Science Data Science and Innovations for Intelligent Systems** *Data Science in Cybersecurity and Cyberthreat Intelligence* Data Mining and Machine Learning in Cybersecurity **Data Analytics and Decision Support for Cybersecurity** *Perspectives on Data Science for Software Engineering* **Machine Learning and Security** Research Anthology on Combating Denial-of-Service Attacks *The Data Science Design Manual* **Data Science from Scratch Cybersecurity Analytics Handbook of Research on Automated Feature Engineering and Advanced Applications in Data Science** *Targeted Cyber Attacks* **Data Science and Social Research Data-Driven Security** *Intelligent Security Systems* AI and Big Data’s Potential for Disruptive Innovation **Science Under Attack** Censoring Science *Building Data Science Teams* **Attack and Defend Computer Security Set Data Science for Cyber-Security Data Science for Undergraduates** *Data Science at the Command Line Insider Attack and Cyber Security Applied Risk Analysis for Guiding Homeland Security Policy and Decisions* **AI in Cybersecurity** *Adversarial Machine Learning* Rootkits and Bootkits *Machine Learning for Cybersecurity Cookbook Internet of Things Security* Recent Advances in Intrusion Detection **Practical Binary Analysis** Essential Cybersecurity Science Surreptitious Software *Panic Attack* The Capitol Riots Data Science and Big Data Analytics

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Cybersecurity Analytics Oct 24 2021 Cybersecurity Analytics is for the cybersecurity student and professional who wants to learn data science techniques critical for tackling cybersecurity challenges, and for the data science student and professional who wants to learn about cybersecurity adaptations. Trying to build a malware detector, a phishing email detector, or just interested in finding patterns in your datasets? This book can let you do it on your own. Numerous examples and datasets links are included so that the reader can "learn by doing." Anyone with a basic college-level calculus course and some probability knowledge can easily understand most of the material. The book includes chapters containing: unsupervised learning, semi-supervised learning, supervised learning, text mining, natural language processing, and more. It also includes background on security, statistics, and linear algebra. The website for the book contains a listing of datasets, updates, and other resources for serious practitioners.

Data Science and Social Research Jul 21 2021 This edited volume lays the groundwork for Social Data Science, addressing epistemological issues, methods, technologies, software and applications of data science in the social sciences. It presents data science techniques for the collection, analysis and use of both online and offline new (big) data in social research and related applications. Among others, the individual contributions cover topics like social media, learning analytics, clustering, statistical literacy, recurrence analysis and network analysis. Data science is a multidisciplinary approach based mainly on the methods of statistics and computer science, and its aim is to develop appropriate methodologies for forecasting and decision-making in response to an increasingly complex reality often characterized by large amounts of data (big data) of various types (numeric, ordinal and nominal variables, symbolic data, texts, images, data streams, multi-way data, social networks etc.) and from diverse sources. This book presents selected papers from the international conference on Data Science & Social Research, held in Naples, Italy in February 2016, and will appeal to researchers in the social sciences working in academia as well as in statistical institutes and offices.

Targeted Cyber Attacks Aug 22 2021 Cyber-crime increasingly impacts both the online and offline world, and targeted attacks play a significant role in disrupting services in both. Targeted attacks are those that are aimed at a particular individual, group, or type of site or service. Unlike worms and viruses that usually attack indiscriminately, targeted attacks involve intelligence-gathering and planning to a degree that drastically changes its profile. Individuals, corporations, and even governments are facing new threats from targeted attacks. Targeted Cyber Attacks examines real-world examples of directed attacks and provides insight into what techniques and resources are used to stage these attacks so that you can counter them more effectively. A well-structured introduction into the world of targeted cyber-attacks Includes analysis of real-world attacks Written by cyber-security researchers and experts

Internet of Things Security Feb 02 2020 The Internet of Things (IoT), with its technological advancements and massive innovations, is building the idea of inter-connectivity among everyday life objects. With an explosive growth in the number of Internet-connected devices, the implications of the idea of IoT on enterprises, individuals, and society are huge. IoT is getting attention from both academia and industry due to its powerful real-time applications that raise demands to understand the entire spectrum of the field. However, due to increasing security issues, safeguarding the IoT ecosystem has become an important concern. With devices and information becoming more exposed and leading to increased attack possibilities, adequate security measures are required to leverage the benefits of this emerging concept. Internet of Things Security: Principles, Applications, Attacks, and Countermeasures is an extensive source that aims at establishing an understanding of the core concepts of IoT among its readers and the challenges and corresponding countermeasures in the field. Key features: Containment of theoretical aspects, as well as recent empirical findings associated with the underlying technologies Exploration of various challenges and trade-offs associated with the field and approaches to ensure security, privacy, safety, and trust across its key elements Vision of exciting areas for future research in the field to enhance the overall productivity This book is suitable for industrial professionals and practitioners, researchers, faculty members, and students across universities who aim to carry out research and development in the field of IoT security.

Data Science and Innovations for Intelligent Systems Aug 02 2022 Data science is an emerging field and innovations in it need to be explored for the success of society 5.0. This book not only focuses on the practical applications of data science to achieve computational excellence, but also digs deep into the issues and implications of intelligent systems. This book highlights innovations in data science to achieve computational excellence that can optimize performance of smart applications. The book focuses on methodologies, framework, design issues, tools, architectures, and technologies necessary to develop and understand data science and its emerging applications in the present era. This book will be useful for the research community, start-up entrepreneurs, academicians, and data centered industries and professors that are interested in exploring innovations in varied applications and areas of data science.

Statistics and Data Science Sep 03 2022 This book constitutes the proceedings of the Research School on Statistics and Data Science, RSSDS 2019, held in Melbourne, VIC, Australia, in July 2019. The 11 papers presented in this book were carefully reviewed and selected from 23 submissions. The volume also contains 7 invited talks. The workshop brought together academics, researchers, and industry practitioners of statistics and data science, to discuss numerous advances in the disciplines and their impact on the sciences and society. The topics covered are data analysis, data science, data mining, data visualization, bioinformatics, machine learning, neural networks, statistics, and probability.

Data Mining and Machine Learning in Cybersecurity May 31 2022 With the rapid advancement of information discovery techniques, machine learning and data mining continue to play a significant role in cybersecurity. Although several conferences, workshops, and journals focus on the fragmented research topics in this area, there has been no single interdisciplinary resource on past and current works and possible

Data Science in Cybersecurity and Cyberthreat Intelligence Jul 01 2022 This book presents a collection of state-of-the-art approaches to utilizing machine learning, formal knowledge bases and rule sets, and semantic reasoning to detect attacks on communication networks, including IoT infrastructures, to automate malicious code detection, to efficiently predict cyberattacks in enterprises, to identify malicious URLs and DGA-generated domain names, and to improve the security of mHealth wearables. This book details how analyzing the likelihood of vulnerability exploitation using machine learning classifiers can offer an alternative to traditional penetration testing solutions. In addition, the book describes a range of techniques that support data aggregation and data fusion to automate data-driven analytics in cyberthreat intelligence, allowing complex and previously unknown cyberthreats to be identified and classified, and countermeasures to be incorporated in novel incident response and intrusion detection mechanisms.

AI and Big Data’s Potential for Disruptive Innovation Apr 17 2021 Big data and artificial intelligence (AI) are at the forefront of technological advances that represent a potential transformational mega-trend—a new multipolar and innovative disruption. These technologies, and their associated management paradigm, are already rapidly impacting many industries and occupations, but in some sectors, the change is just beginning. Innovating ahead of emerging technologies is the new imperative for any organization that aspires to succeed in the next decade. Faced with the power of this AI movement, it is imperative to understand the dynamics and new codes required by the disruption and to adapt accordingly. AI and Big Data’s Potential for Disruptive Innovation provides emerging research exploring the theoretical and practical aspects of successfully implementing new and innovative technologies in a variety of sectors including business, transportation, and healthcare. Featuring coverage on a broad range of topics such as semantic mapping, ethics in AI, and big data governance, this book is ideally designed for IT specialists, industry professionals, managers, executives, researchers, scientists, and engineers seeking current research on the production of new and innovative mechanization and its disruptions.

Insider Attack and Cyber Security Aug 10 2020 This book defines the nature and scope of insider problems as viewed by the financial industry. This edited volume is based on the first workshop on Insider Attack and Cyber Security, IACS 2007. The workshop was a joint effort from the Information Security Departments of Columbia University and Dartmouth College. The book sets an agenda for an ongoing research initiative to solve one of the most vexing problems encountered in security, and a range of topics from critical IT infrastructure to insider threats. In some ways, the insider problem is the ultimate security problem.

Applied Risk Analysis for Guiding Homeland Security Policy and Decisions Jul 09 2020 Presents various challenges faced by security policy makers and risk analysts, and mathematical approaches that inform homeland security policy development and decision support Compiled by a group of highly qualified editors, this book provides a clear connection between risk science and homeland security policy making and includes top-notch contributions that uniquely highlight the role of risk analysis for informing homeland security policy decisions. Featuring discussions on various challenges faced in homeland security risk analysis, the book seamlessly divides the subject of risk analysis for homeland security into manageable chapters, which are organized by the concept of risk-informed decisions, methodology for applying risk analysis, and relevant examples and case studies. Applied Risk Analysis for Guiding Homeland Security Policy and Decisions offers an enlightening overview of risk analysis methods for homeland security. For instance, it presents readers with an exploration of radiological and nuclear risk assessment, along with analysis of uncertainties in radiological and nuclear pathways. It covers the advances in risk analysis for border security, as well as for cyber security. Other topics covered include: strengthening points of entry; systems modeling for rapid containment and casualty mitigation; and disaster preparedness and critical infrastructure resilience. Highlights how risk analysis helps in the decision-making process for homeland security policy Presents specific examples that detail how various risk analysis methods provide decision support for homeland security policy makers and risk analysts Describes numerous case studies from academic, government, and industrial perspectives that apply risk analysis methods for addressing challenges within the U.S. Department of Homeland Security (DHS) Offers detailed information regarding each of the five DHS missions: prevent terrorism and enhance security; secure and manage our borders; enforce and administer our immigration laws; safeguard and secure cyberspace; and strengthen national preparedness and resilience Discusses the various approaches and challenges faced in homeland risk analysis and identifies improvements and methodological advances that influenced DHS to adopt an increasingly risk-informed basis for decision-making Written by top educators and professionals who clearly illustrate the link between risk science and homeland security policy making Applied Risk Analysis for Guiding Homeland Security Policy and Decisions is an excellent textbook and/or supplement for upper-undergraduate and graduate-level courses related to homeland security risk analysis. It will also be an extremely beneficial resource and reference for homeland security policy analysts, risk analysts, and policymakers from private and public sectors, as well as researchers, academics, and practitioners who utilize security risk analysis methods.

Machine Learning for Cybersecurity Cookbook Mar 05 2020 Learn how to apply modern AI to create powerful cybersecurity solutions for malware, pentesting, social engineering, data privacy, and intrusion detection Key FeaturesManage data of varying complexity to protect your system using the Python ecosystemApply ML to pentesting, malware, data privacy, intrusion detection system(IDS) and social engineeringAutomate your daily workflow by addressing various security challenges using the recipes covered in the bookBook Description Organizations today face a major threat in terms of cybersecurity, from malicious URLs to credential reuse, and having robust security systems can make all the difference. With this book, you'll learn how to use Python libraries such as TensorFlow and scikit-learn to implement the latest artificial intelligence (AI) techniques and handle challenges faced by cybersecurity researchers. You'll begin by exploring various machine learning (ML) techniques and tips for setting up a secure lab environment. Next, you'll implement key ML algorithms such as clustering, gradient boosting, random forest, and XGBoost. The book will guide you through constructing classifiers and features for malware, which you'll train and test on real samples. As you progress, you'll build self-learning, reliant systems to handle cybersecurity tasks such as identifying malicious URLs, spam email detection, intrusion detection, network protection, and tracking user and process behavior. Later, you'll apply generative adversarial networks (GANs) and autoencoders to advanced security tasks. Finally, you'll delve into secure and private AI to protect the privacy rights of consumers using your ML models. By the end of this book, you'll have the skills you need to tackle real-world problems faced in the cybersecurity domain using a recipe-based approach. What you will learnLearn how to build malware classifiers to detect suspicious activitiesApply ML to generate custom malware to pentest your securityUse ML algorithms with complex datasets to implement cybersecurity conceptsCreate neural networks to identify fake videos and imagesSecure your organization from one of the most popular threats – insider threatsDefend against zero-day threats by constructing an anomaly detection systemDetect web vulnerabilities effectively by combining Metasploit and MLUnderstand how to train a model without exposing the training dataWho this book is for This book is for cybersecurity professionals and security researchers who are looking to implement the latest machine learning techniques to boost computer security, and gain insights into securing an organization using red and blue team ML. This recipe-based book will also be useful for data scientists and machine learning developers who want to experiment with smart techniques in the cybersecurity domain. Working knowledge of Python programming and familiarity with cybersecurity fundamentals will help you get the most out of this book.

Data-Driven Security Jun 19 2021 Uncover hidden patterns of data and respond withcountermeasures Security professionals need all the tools at their disposal toincrease their visibility in order to prevent security breaches andattacks. This careful guide explores two of the most powerful data analysis and visualization. You'll soon understand how toharness and wield data, from collection and storage to managementand analysis as well as visualization and presentation. Using ahands-on approach with real-world examples, this book shows you howto gather feedback, measure the effectiveness of your securitymethods, and make better decisions. Everything in this book will have practical application forinformation security professionals. Helps IT and security professionals understand and use data, sothey can thwart attacks and understand and visualizevulnerabilities in their networks Includes more than a dozen real-world examples and hands-onexercises that demonstrate how to analyze security data andintelligence and translate that information into visualizationsthat make plain how to prevent attacks Covers topics such as how to acquire and prepare security data,use simple statistical methods to detect malware, predict roguebehavior, correlate security events, and more Written by a team of well-known experts in the field ofsecurity and data analysis Lock down your networks, prevent hacks, and thwart malware byimproving visibility into the environment, all through the power ofdata and Security Using Data Analysis, Visualization, andDashboards.

Adversarial Machine Learning May 07 2020 This study allows readers to get to grips with the conceptual tools and practical techniques for building robust machine learning in the face of adversaries.

Perspectives on Data Science for Software Engineering Mar 29 2022 Perspectives on Data Science for Software Engineering presents the best practices of seasoned data miners in software engineering. The idea for this book was created during the 2014 conference at Dagstuhl, an invitation-only gathering of leading computer scientists who meet to identify and discuss cutting-edge informatics topics. At the 2014 conference, the concept of how to transfer the knowledge of experts from seasoned software engineers and data scientists to newcomers in the field highlighted many discussions. While there are many books covering data mining and software engineering basics, they present only the fundamentals and lack the perspective that comes from real-world experience. This book offers unique insights into the wisdom of the community’s leaders gathered to share hard-won lessons from the trenches. Ideas are presented in digestible chapters designed to be applicable across many domains. Topics included cover data collection, data sharing, data mining, and how to utilize these techniques in successful software projects. Newcomers to software engineering data science will learn the tips and tricks of the trade, while more experienced data scientists will benefit from war stories that show what traps to avoid. Presents the wisdom of community experts, derived from a summit on software analytics Provides contributed chapters that share discrete ideas and technique from the trenches Covers top areas of concern, including mining security and social data, data visualization, and cloud-based data Presented in clear chapters designed to be applicable across many domains

Censoring Science Feb 13 2021 The dramatic story of global warming, politics, and the scientist Al Gore calls “the most powerful and consistent voice calling for intelligent action to preserve our planet's environment.” Censoring Science is the gripping story of the world's preeminent climatologist, Dr. James Hansen, the “pivotal character in the greatest and most politically charged science story of our time” (New Scientist). NASA's leading climate expert, Dr. Hansen first broke the international news on global warming at a Senate hearing in 1988. Little did he expect the rising storm of politically motivated resistance, denial, and obstruction. Revealing the extent of the Bush administration's censorship of Dr. Hansen's findings, Censoring Science sets the record straight with solid scientific facts such as: the hottest years on record have occurred in the last two decades, and ice is melting at record rates all around the planet. Dr. Hansen shows how we can still prevent environmental disaster if the country and the government are willing to face the truth about global warming.

Panic Attack Aug 29 2019 “Follow the science” is what they said. “Follow our politics” is what they meant. In Panic Attack, nationally bestselling author and physician Nicole Saphier uncovers the hypocrisy and hysteria which has characterized so much of the American pandemic response. While journalists trumpeted the importance of following science to “flatten the curve,” they praised Governors Andrew Cuomo and Phil Murphy, who sanctioned ill-equipped nursing homes to take COVID-positive patients, leading to an enormous death spike for New York and New Jersey. Plus, the old guard medical establishment captured by Dr. Fauci proved to be far too rigid during a health care emergency. While some state legislators are still concealing accurate records of nursing home deaths, many others have made anti-science decisions regarding re-opening plans; all of which fuel distrust and civil unrest. Democrat mayors like Bill de Blasio openly admitted that their decisions to keep schools closed were fueled by a “social contract” with teachers (that is: teachers’ unions), despite hard science saying this would be harmful. When anti-science measures are continuously implemented, the long-term consequences of such actions will likely stay with us for years to come. The pandemic has resulted in a failure of government, much of which is unavoidable in a unique disaster scenario. However, the rampant politicization of science, from the origin of the virus to the simple concept of wearing facemasks, has hopelessly muddied the water, divided the country, and knee-jerk anti-Trumpism made it all worse.

AI in Cybersecurity Jun 07 2020 This book presents a collection of state-of-the-art AI approaches to cybersecurity and cyberthreat intelligence, offering strategic defense mechanisms for malware, addressing cybercrime, and assessing vulnerabilities to yield proactive rather than reactive countermeasures. The current variety and scope of cybersecurity threats far exceed the capabilities of even the most skilled security professionals. In addition, analyzing yesterday's security incidents no longer enables experts to predict and prevent tomorrow's attacks, which necessitates approaches that go far beyond identifying known threats. Nevertheless, there are promising avenues: complex behavior matching can isolate threats based on the actions taken, while machine learning can help detect anomalies, prevent malware infections, discover signs of illicit activities, and protect assets from hackers. In turn, knowledge representation enables automated reasoning over network data, helping achieve cybersituational awareness. Bringing together contributions by high-caliber experts, this book suggests new research directions in this critical and rapidly growing field.

The Capitol Riots Jul 29 2019 The Capitol Riots maps out the events of the January 6, 2021 insurrectionary riots at the United States Capitol building, providing context for understanding the contributing factors and ongoing implications of the uprising. This definitive text explores the rise of populism, disinformation, conspiracy theories, the alt-right, and white supremacy during the lead-up to and planning of the Stop the Steal campaign, as well as the complex interplay during the riots of political performances, costumes, objectives, communications, digital media, datafication, race, gender, and—ultimately—power. Assembling raw data from social media, selfie photos and videos, and mainstream journalism, the authors develop a timeline and data visualizations representing the events. They delve into the complex, openly shared narratives, motivations, and actions of people on the ground that day who violated the symbolic center of U.S. democracy. An analysis of visual data reveals an affective outpouring of mutually amplifying expressions of frustration, fear, hate, anger, and anomie that correspond to similar logics and counter-logics in the polarized and chaotic contemporary media environment that have only been intensified by COVID-19 lockdowns, conspiracy theories, and a call to action at the Capitol from the outgoing POTUS and his inner circle. The book will appeal to both a general audience of those curious about how and why the Capitol riots unfolded and to students and scholars of communications, political science, media studies, sociology, education, surveillance studies, digital humanities, gender studies, critical whiteness studies, and datafication studies. It will also find an audience within computer science and technology studies through its approach to big data, data visualization, AI, algorithms, data tracking, and other data sciences.

Data Science for Cyber-Security Nov 12 2020 Cyber-security is a matter of rapidly growing importance in industry and government. This book provides insight into a range of data science techniques for addressing these pressing concerns. The application of statistical and broader data science techniques provides an exciting growth area in the design of cyber defences. Networks of connected devices, such as enterprise computer networks or the wider so-called Internet of Things, are all vulnerable to misuse and attack, and data science methods offer the promise to detect such behaviours from the vast collections of cyber traffic data sources that can be obtained. In many cases, this is achieved through anomaly detection of unusual behaviour against understood statistical models of normality. This volume presents contributed papers from an international conference of the same name held at Imperial College. Experts from the field have provided their latest discoveries and review state of the art technologies.

Data Science at the Command Line Sep 10 2020 This thoroughly revised guide demonstrates how the flexibility of the command line can help you become a more efficient and productive data scientist. You'll learn how to combine small yet powerful command-line tools to quickly obtain, scrub, explore, and model your data. To get you started, author Jeroen Janssens provides a Docker image packed with over 80 tools--useful whether you work with Windows, macOS, or Linux. You'll quickly discover why the command line is an agile, scalable, and extensible technology. Even if you're comfortable processing data with Python or R, you'll learn how to greatly improve your data science workflow by leveraging the command line's power. This book is ideal for data scientists, analysts, and engineers; software and machine learning engineers; and system administrators. Obtain data from websites, APIs, databases, and spreadsheets Perform scrub operations on text, CSV, HTM, XML, and JSON files Explore data, compute descriptive statistics, and create visualizations Manage your data science workflow Create reusable command-line tools from one-liners and existing Python or R code Parallelize and distribute data-intensive pipelines Model data with dimensionality reduction, clustering, regression, and classification algorithms

Data Science and Big Data Analytics Jun 27 2019 Data Science and Big Data Analytics is about harnessing the power of data for new insights. The book covers the breadth of activities and methods and tools that Data Scientists use. The content focuses on concepts, principles and practical applications that are applicable to any industry and technology environment, and the learning is supported and explained with examples that you can replicate using open-source software. This book will help you: Become a contributor on a data science team Deploy a structured lifecycle approach to data analytics problems Apply appropriate analytic techniques and tools to analyzing big data Learn how to tell a compelling story with data to drive business action Prepare for EMC Proven Professional Data Science Certification Corresponding data sets are available from the book's page at Wiley which you can find on the Wiley site by searching for the ISBN 9781118876138. Get started discovering, analyzing, visualizing, and presenting data in a meaningful way today!

Malware Data Science Nov 05 2022 Malware Data Science explains how to identify, analyze, and classify large-scale malware using machine learning and data visualization. Security has become a "big data" problem. The growth rate of malware has accelerated to tens of millions of new files per year while our networks generate an ever-larger flood of security-relevant data each day. In order to defend against these advanced attacks, you'll need to know how to think like a data scientist. In Malware Data Science, security data scientist Joshua Saxe introduces machine learning, statistics, social network analysis, and data visualization, and shows you how to apply these methods to malware detection and analysis. You'll learn how to: - Analyze malware using static analysis - Observe malware behavior using dynamic analysis - Identify adversary groups through shared code analysis - Catch 0-day vulnerabilities by building your own machine learning detector - Measure malware detector accuracy - Identify malware campaigns, trends, and relationships through data visualization Whether you're a malware analyst looking to add skills to your existing arsenal, or a data scientist interested in attack detection and threat intelligence, Malware Data Science will help you stay ahead of the curve.

Science Under Attack Mar 17 2021 Evidence and logic are lacking in many areas of public debate today on hot-button issues ranging from dietary fat to vaccination. In Science Under Attack, Dr. Alexander shows how science is being abused, sidelined or ignored, making it difficult or impossible for the public to form a reasoned opinion about important issues. Readers will learn why science is becoming more corrupt, and also how it is being abused for political and economic gain, support of activism, or the propping up of religious beliefs. To illustrate how science is being ignored and abused, the author examines six different issues and the way they are currently discussed: evolution, dietary fat, climate change, vaccination, GMO crops and continental drift. In his research, he has gone back to the original source wherever possible rather than quoting second-hand sources, adding a degree of accuracy and nuance often missing. The controversial assertion that science does not support the conventional wisdom on climate change should be of particular interest. Alexander shows that the scientific evidence for a substantial human contribution to climate change is actually flimsy, and he demonstrates the fallacy of comparing the strong link between smoking and lung cancer to the much weaker connection between human activity and global warming.

Data Science for Undergraduates Oct 12 2020 Data science is emerging as a field that is revolutionizing science and industries alike. Work across nearly all domains is becoming more data driven, affecting both the jobs that are available and the skills that are required. As more data and ways of analyzing them become available, more aspects of the economy, society, and daily life will become dependent on data. It is imperative that educators, administrators, and students begin today to consider how to best prepare for and keep pace with this data-driven era of tomorrow. Undergraduate teaching, in particular, offers a critical link in offering more data science exposure to students and expanding the supply of data science talent. Data Science for Undergraduates: Opportunities and Options offers a vision for the emerging discipline of data science at the undergraduate level. This report outlines some considerations and approaches for academic institutions and others in the broader data science communities to help guide the ongoing transformation of this field.

Machine Learning and Security Feb 25 2022 Can machine learning techniques solve our computer security problems and finally put an end to the cat-and-mouse game between attackers and defenders? Or is this hope merely hype? Now you can dive into the science and answer this question for yourself! With this practical guide, you'll explore ways to apply machine learning to security issues such as intrusion detection, malware classification, and network analysis. Machine learning and security specialists Clarence Chio and David Freeman provide a framework for discussing the marriage of these two fields, as well as a toolkit of machine-learning algorithms that you can apply to an array of security problems. This book is ideal for security engineers and data scientists alike. Learn how machine learning has contributed to the success of modern spam filters Quickly detect anomalies, including breaches, fraud, and impending system failure Conduct malware analysis by extracting useful information from computer binaries Uncover attackers within the network by finding patterns inside datasets Examine how attackers exploit consumer-facing websites and app functionality Translate your machine learning algorithms from the lab to production Understand the threat attackers pose to machine learning solutions

Rootkits and Bootkits Apr 05 2020 Rootkits and Bootkits will teach you how to understand and counter sophisticated, advanced threats buried deep in a machine's boot process or UEFI firmware. With the aid of numerous case studies and professional research from three of the world's leading security experts, you'll trace malware development over time from rootkits like TDL3 to present-day UEFI implants and examine how they infect a system, persist through reboot, and evade security software. As you inspect and dissect real malware, you'll learn: • How Windows boots—including 32-bit, 64-bit, and UEFI mode—and where to find vulnerabilities • The details of boot process security mechanisms like Secure Boot, including an overview of Virtual Secure Mode (VSM) and Device Guard • Reverse engineering and forensic techniques for analyzing real malware, including bootkits like Rovnix/Carberp, Gapz, TDL4, and the infamous rootkits TDL3 and Festi • How to perform static and dynamic analysis using emulation and tools like Bochs and IDA Pro • How to better understand the delivery stage of threats against BIOS and UEFI firmware in order to create detection capabilities • How to use virtualization tools like VMware Workstation to reverse engineer bootkits and the Intel Chipsec tool to dig into forensic analysis Cybercrime syndicates and malicious actors will continue to write ever more persistent and covert attacks, but the game is not lost. Explore the cutting edge of malware analysis with Rootkits and Bootkits. Covers boot processes for Windows 32-bit and 64-bit operating systems.

The Data Science Design Manual Dec 26 2021 This engaging and clearly written textbook/reference provides a must-have introduction to the rapidly emerging interdisciplinary field of data science. It focuses on the principles fundamental to becoming a good data scientist and the key skills needed to build systems for collecting, analyzing, and interpreting data. The Data Science Design Manual is a source of practical insights that highlights what really matters in analyzing data, and provides an intuitive understanding of how these core concepts can be used. The book does not emphasize any particular programming language or suite of data-analysis tools, focusing instead on high-level discussion of important design principles. This easy-to-read text ideally serves the needs of undergraduate and early graduate students embarking on an "Introduction to Data Science" course. It reveals how this discipline sits at the intersection of statistics, computer science, and machine learning, with a distinct heft and character of its own. Practitioners in these and related fields will find this book perfect for self-study as well. Additional learning tools: Contains "War Stories," offering perspectives on how data science applies in the real world Includes "Homework Problems," providing a wide range of exercises and projects for self-study Provides a complete set of lecture slides and online video lectures at www.data-manual.com Provides "Take-Home Lessons," emphasizing the big-picture concepts to learn from each chapter Recommends exciting "Kaggle Challenges" from the online platform Kaggle Highlights "False Starts," revealing the subtle reasons why certain approaches fail Offers examples taken from the data science television show "The Quant Shop" (www.quant-shop.com)

Attack and Defend Computer Security Set Dec 14 2020 Defend your networks and data from attack with this unique two-book security set The Attack and Defend Computer Security Set is a two-book set comprised of the bestselling second edition of Web Application Hacker's Handbook and Malware Analyst's Cookbook. This special security bundle combines coverage of the two most crucial tactics used to defend networks, applications, and data from attack while giving security professionals insight into the underlying details of these attacks themselves. The Web Application Hacker's Handbook takes a broad look at web application security and exposes the steps a hacker can take to attack an application, while providing information on how the application can defend itself. Fully updated for the latest security trends and threats, this guide covers remoting frameworks, HTML5, and cross-domain integration techniques along with clickjacking, framebusting, HTTP parameter pollution, XML external entity injection, hybrid file attacks, and more. The Malware Analyst's Cookbook includes a book and DVD and is designed to enhance the analytical capabilities of anyone who works with malware. Whether you're tracking a Trojan across networks, performing an in-depth binary analysis, or inspecting a machine for potential infections, the recipes in this book will help you go beyond the basic tools for tackling security challenges to cover how to extend your favorite tools or build your own from scratch using C, Python, and Perl source code. The companion DVD features all the files needed to work through the recipes in the book and to complete reverse-engineering challenges along the way. The Attack and Defend Computer Security Set gives your organization the security tools needed to sound the alarm and stand your ground against malicious threats lurking online.

Essential Cybersecurity Science Oct 31 2019 If you're involved in cybersecurity as a software developer, forensic investigator, or network administrator, this practical guide shows you how to apply the scientific method when assessing techniques for protecting your information systems. You'll learn how to conduct scientific experiments on everyday tools and procedures, whether you're evaluating corporate security systems, testing your own security product, or looking for bugs in a mobile game. Once author Josiah Dykstra gets you up to speed on the scientific method, he helps you focus on standalone, domain-specific topics, such as cryptography, malware analysis, and system security engineering. The latter chapters include practical case studies that demonstrate how to use available tools to conduct domain-specific scientific experiments. Learn the steps necessary to conduct scientific experiments in cybersecurity Explore fuzzing to test how your software handles various inputs Measure the performance of the Snort intrusion detection system Locate malicious "needles in a haystack" in your network and IT environment Evaluate cryptography design and application in IoT products Conduct an experiment to identify relationships between similar malware binaries Understand system-level security requirements for enterprise networks and web services

Research Anthology on Combating Denial-of-Service Attacks Jan 27 2022 Our world is increasingly driven by sophisticated networks of advanced computing technology, and the basic operation of everyday society is becoming increasingly vulnerable to these networks' shortcomings. The implementation and upkeep of a strong network defense is a substantial challenge, beset not only by economic disincentives but also by an inherent logistical bias that grants advantage to attackers. Research Anthology on Combating Denial-of-Service Attacks examines the latest research on the development of intrusion detection systems and best practices for preventing and combatting cyber-attacks intended to disrupt business and user experience. Highlighting a range of topics such as network administration, application-layer protocols, and malware detection, this publication is an ideal reference source for cybersecurity professionals, IT specialists, policymakers, forensic analysts, technology developers, security administrators, academicians, researchers, and students.

Practical Binary Analysis Dec 02 2019 Stop manually analyzing binary! Practical Binary Analysis is the first book of its kind to present advanced binary analysis topics, such as binary instrumentation, dynamic taint analysis, and symbolic execution, in an accessible way. As malware increasingly obfuscates itself and applies anti-analysis techniques to thwart our analysis, we need more sophisticated methods that allow us to raise that dark curtain designed to keep us out--binary analysis can help. The goal of all binary analysis is to determine (and possibly modify) the true properties of binary programs to understand what they really do, rather than what we think they should do. While reverse engineering and disassembly are critical first steps in many forms of binary analysis, there is much more to be learned. This hands-on guide teaches you how to tackle the fascinating but challenging topics of binary analysis and instrumentation and helps you become proficient in an area typically only mastered by a small group of expert hackers. It will take you from basic concepts to state-of-the-art methods as you dig into topics like code injection, disassembly, dynamic taint analysis, and binary instrumentation. Written for security engineers, hackers, and those with a basic working knowledge of C/C++ and x86-64, Practical Binary Analysis will teach you in-depth how binary programs work and help you acquire the tools and techniques needed to gain more control and insight into binary programs. Once you've completed an introduction to basic binary formats, you'll learn how to analyze binaries using techniques like the GNU/Linux binary analysis toolchain, disassembly, and code injection. You'll then go on to implement profiling tools with Pin and learn how to build your own dynamic taint analysis tools with libdft and symbolic execution tools using Triton. You'll learn how to: - Parse ELF and PE binaries and build a binary loader with libbfd - Use data-flow analysis techniques like program tracing, slicing, and reaching definitions analysis to reason about runtime flow of your programs - Modify ELF binaries with techniques like parasitic code injection and hex editing - Build custom disassembly tools with Capstone - Use binary instrumentation to circumvent anti-analysis tricks commonly used by malware - Apply taint analysis to detect control hijacking and data leak attacks - Use symbolic execution to build automatic exploitation tools With exercises at the end of each chapter to help solidify your skills, you'll go from understanding basic assembly to performing some of the most sophisticated binary analysis and instrumentation. Practical Binary Analysis gives you what you need to work effectively with binary programs and transform your knowledge from basic understanding to expert-level proficiency.

Intelligent Security Systems May 19 2021 INTELLIGENT SECURITY SYSTEMS Dramatically improve your cybersecurity using AI and machine learning In Intelligent Security Systems, distinguished professor and computer scientist Dr. Leon Reznik delivers an expert synthesis of artificial intelligence, machine learning and data science techniques, applied to computer security to assist readers in hardening their computer systems against threats. Emphasizing practical and actionable strategies that can be immediately implemented by industry professionals and computer device's owners, the author explains how to install and harden firewalls, intrusion detection systems, attack recognition tools, and malware protection systems. He also explains how to recognize and counter common hacking activities. This book bridges the gap between cybersecurity education and new data science programs, discussing how cutting-edge artificial intelligence and machine learning techniques can work for and against cybersecurity efforts. Intelligent Security Systems includes supplementary resources on an author-hosted website, such as classroom presentation slides, sample review, test and exam questions, and practice exercises to make the material contained practical and useful. The book also offers: A thorough introduction to computer security, artificial intelligence, and machine learning, including basic definitions and concepts like threats, vulnerabilities, risks, attacks, protection, and tools An exploration of firewall design and implementation, including firewall types and models, typical designs and configurations, and their limitations and problems Discussions of intrusion detection systems (IDS), including architecture topologies, components, and operational ranges, classification approaches, and machine learning techniques in IDS design A treatment of malware and vulnerabilities detection and protection, including malware classes, history, and development trends Perfect for undergraduate and graduate students in computer security, computer science and engineering, Intelligent Security Systems will also earn a place in the libraries of students and educators in information technology and data science, as well as professionals working in those fields.

Handbook of Research on Automated Feature Engineering and Advanced Applications in Data Science Sep 22 2021 In today's digital world, the huge amount of data being generated is unstructured, messy, and chaotic in nature. Dealing with such data, and attempting to unfold the meaningful information, can be a challenging task. Feature engineering is a process to transform such data into a suitable form that better assists with interpretation and visualization. Through this method, the transformed data is more transparent to the machine learning models, which in turn causes better prediction and analysis of results. Data science is crucial for the data scientist to assess the trade-offs of their decisions regarding the effectiveness of the machine learning model implemented. Investigating the demand in this area today and in the future is a necessity. The Handbook of Research on Automated Feature Engineering and Advanced Applications in Data Science provides an in-depth analysis on both the theoretical and the latest empirical research findings on how features can be extracted and transformed from raw data. The chapters will introduce feature engineering and the recent concepts, methods, and applications with the use of various data types, as well as examine the latest machine learning applications on the data. While highlighting topics such as detection, tracking, selection techniques, and prediction models using data science, this book is ideally intended for research scholars, big data scientists, project developers, data analysts, and computer scientists along with practitioners, researchers, academicians, and students interested in feature engineering and its impact on data.

Data Analytics and Decision Support for Cybersecurity Apr 29 2022 The book illustrates the inter-relationship between several data management, analytics and decision support techniques and methods commonly adopted in Cybersecurity-oriented frameworks. The recent advent of Big Data paradigms and the use of data science methods, has resulted in a higher demand for effective data-driven models that support decision-making at a strategic level. This motivates the need for defining novel data analytics and decision support approaches in a myriad of real-life scenarios and problems, with Cybersecurity-related domains being no exception. This contributed volume comprises nine chapters, written by leading international researchers, covering a compilation of recent advances in Cybersecurity-related applications of data analytics and decision support approaches. In addition to theoretical studies and overviews of existing relevant literature, this book comprises a selection of application-oriented research contributions. The investigations undertaken across these chapters focus on diverse and critical Cybersecurity problems, such as Intrusion Detection, Insider Threats, Insider Threats, Collusion Detection, Run-Time Malware Detection, Intrusion Detection, E-Learning, Online Examinations, Cybersecurity noisy data removal, Secure Smart Power Systems, Security Visualization and Monitoring. Researchers and professionals alike will find the chapters an essential read for further research on the topic.

Data Science For Cyber-security Oct 04 2022 Cyber-security is a matter of rapidly growing importance in industry and government. This book provides insight into a range of data science techniques for addressing these pressing concerns.The application of statistical and broader data science techniques provides an exciting growth area in the design of cyber defences. Networks of connected devices, such as enterprise computer networks or the wider so-called Internet of Things, are all vulnerable to misuse and attack, and data science methods offer the promise to detect such behaviours from the vast collections of cyber traffic data sources that can be obtained. In many cases, this is achieved through anomaly detection of unusual behaviour against understood statistical models of normality.This volume presents contributed papers from an international conference of the same name held at Imperial College. Experts from the field have provided their latest discoveries and review state of the art technologies.

Building Data Science Teams Jan 15 2021 As data science evolves to become a business necessity, the importance of assembling a strong and innovative data teams grows. In this in-depth report, data scientist DJ Patil explains the skills, perspectives, tools and processes that position data science teams for success. Topics include: What it means to be "data driven." The unique roles of data scientists. The four essential qualities of data scientists. Patil's first-hand experience building the LinkedIn data science team.

Data Science from Scratch Nov 24 2021 Data science libraries, frameworks, modules, and toolkits are great for doing data science, but they're also a good way to dive into the discipline without actually understanding data science. In this book, you'll learn how many of the most fundamental data science tools and algorithms work by implementing them from scratch. If you have an aptitude for mathematics and some programming skills, author Joel Grus will help you get comfortable with the math and statistics at the core of data science, and with hacking skills you need to get started as a data scientist. Today's messy glut of data holds answers to questions no one's even thought to ask. This book provides you with the know-how to dig those answers out. Get a crash course in Python Learn the basics of linear algebra, statistics, and probability—and understand how and when they're used in data science Collect, explore, clean, munge, and manipulate data Dive into the fundamentals of machine learning Implement models such as k-nearest Neighbors, Naive Bayes, linear and logistic regression, decision trees, neural networks, and clustering Explore recommender systems, natural language processing, network analysis, MapReduce, and databases

Surreptitious Software Sep 30 2019 "This book gives thorough, scholarly coverage of an area of growing importance in computer security and is a 'must have' for every researcher, student, and practicing professional in software protection." —Mikhail Atallah, Distinguished Professor of Computer Science at Purdue University Theory, Techniques, and Tools for Fighting Software Piracy, Tampering, and Malicious Reverse Engineering The last decade has seen significant progress in the development of techniques for resisting software piracy and tampering. These techniques are indispensable for software developers seeking to protect vital intellectual property. Surreptitious Software is the first authoritative, comprehensive resource for researchers, developers, and students who want to understand these approaches, the level of security they afford, and the performance penalty they incur. Christian Collberg and Jasvir Nagra bring together techniques drawn from related areas of computer science, including cryptography, steganography, watermarking, software metrics, reverse engineering, and compiler optimization. Using extensive sample code, they show readers how to implement protection schemes ranging from code obfuscation and software fingerprinting to tamperproofing and birthmarking, and discuss the theoretical and practical limitations of these techniques. Coverage includes Mastering techniques that both attackers and defenders use to analyze programs Using code obfuscation to make software harder to analyze and understand Fingerprinting software to identify its author and to trace software pirates Tamperproofing software using guards that detect and respond to illegal modifications of code and data Strengthening content protection through dynamic watermarking and dynamic obfuscation Detecting code theft via software similarity analysis and birthmarking algorithms Using hardware techniques to defend software and media against piracy and tampering Detecting software tampering in distributed system Understanding the theoretical limits of code obfuscation

Recent Advances in Intrusion Detection Jan 03 2020 Annotation This book constitutes the refereed proceedings of the 13th International Symposium on Recent Advances in Intrusion Detection, RAID 2010, held in Ottawa, Canada, in September 2010. The 24 revised full papers presented together with 15 revised poster papers were carefully reviewed and selected from 102 submissions. The papers are organized in topical sections on network protection, high performance, malware detection and defence, evaluation, forensics, anomaly detection as well as web security.