Big Data Forensics – Learning Hadoop Investigations

Perform forensic investigations on Hadoop clusters with cutting-edge tools and techniques

Joe Sremack

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Big Data Forensics Learning Hadoop Investigations

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Big Data Forensics Learning Hadoop Investigations:

Big Data Forensics – Learning Hadoop Investigations Joe Sremack,2015-09-24 Perform forensic investigations on Hadoop clusters with cutting edge tools and techniques About This Book Identify collect and analyze Hadoop evidence forensically Learn about Hadoop s internals and Big Data file storage concepts A step by step guide to help you perform forensic analysis using freely available tools Who This Book Is For This book is meant for statisticians and forensic analysts with basic knowledge of digital forensics They do not need to know Big Data Forensics If you are an IT professional law enforcement professional legal professional or a student interested in Big Data and forensics this book is the perfect hands on guide for learning how to conduct Hadoop forensic investigations Each topic and step in the forensic process is described in accessible language What You Will Learn Understand Hadoop internals and file storage Collect and analyze Hadoop forensic evidence Perform complex forensic analysis for fraud and other investigations Use state of the art forensic tools Conduct interviews to identify Hadoop evidence Create compelling presentations of your forensic findings Understand how Big Data clusters operate Apply advanced forensic techniques in an investigation including file carving statistical analysis and more In Detail Big Data forensics is an important type of digital investigation that involves the identification collection and analysis of large scale Big Data systems Hadoop is one of the most popular Big Data solutions and forensically investigating a Hadoop cluster requires specialized tools and techniques With the explosion of Big Data forensic investigators need to be prepared to analyze the petabytes of data stored in Hadoop clusters Understanding Hadoop s operational structure and performing forensic analysis with court accepted tools and best practices will help you conduct a successful investigation Discover how to perform a complete forensic investigation of large scale Hadoop clusters using the same tools and techniques employed by forensic experts This book begins by taking you through the process of forensic investigation and the pitfalls to avoid It will walk you through Hadoop s internals and architecture and you will discover what types of information Hadoop stores and how to access that data You will learn to identify Big Data evidence using techniques to survey a live system and interview witnesses After setting up your own Hadoop system you will collect evidence using techniques such as forensic imaging and application based extractions You will analyze Hadoop evidence using advanced tools and techniques to uncover events and statistical information Finally data visualization and evidence presentation techniques are covered to help you properly communicate your findings to any audience Style and approach This book is a complete guide that follows every step of the forensic analysis process in detail You will be guided through each key topic and step necessary to perform an investigation Hands on exercises are presented throughout the book and technical reference guides and sample documents are included for real world use Big Data Forensics - Learning Hadoop Investigations Joe Sremack,2015-08-25 Perform forensic investigations on Hadoop clusters with cutting edge tools and techniquesAbout This Book Identify collect and analyze Hadoop evidence forensically Learn about Hadoop s internals and Big

Data file storage concepts A step by step guide to help you perform forensic analysis using freely available toolsWho This Book Is ForThis book is meant for statisticians and forensic analysts with basic knowledge of digital forensics They do not need to know Big Data Forensics If you are an IT professional law enforcement professional legal professional or a student interested in Big Data and forensics this book is the perfect hands on guide for learning how to conduct Hadoop forensic investigations Each topic and step in the forensic process is described in accessible language What You Will Learn Understand Hadoop internals and file storage Collect and analyze Hadoop forensic evidence Perform complex forensic analysis for fraud and other investigations Use state of the art forensic tools Conduct interviews to identify Hadoop evidence Create compelling presentations of your forensic findings Understand how Big Data clusters operate Apply advanced forensic techniques in an investigation including file carving statistical analysis and moreIn DetailBig Data forensics is an important type of digital investigation that involves the identification collection and analysis of large scale Big Data systems Hadoop is one of the most popular Big Data solutions and forensically investigating a Hadoop cluster requires specialized tools and techniques With the explosion of Big Data forensic investigators need to be prepared to analyze the petabytes of data stored in Hadoop clusters Understanding Hadoop s operational structure and performing forensic analysis with court accepted tools and best practices will help you conduct a successful investigation Discover how to perform a complete forensic investigation of large scale Hadoop clusters using the same tools and techniques employed by forensic experts This book begins by taking you through the process of forensic investigation and the pitfalls to avoid It will walk you through Hadoop s internals and architecture and you will discover what types of information Hadoop stores and how to access that data You will learn to identify Big Data evidence using techniques to survey a live system and interview witnesses After setting up your own Hadoop system you will collect evidence using techniques such as forensic imaging and application based extractions You will analyze Hadoop evidence using advanced tools and techniques to uncover events and statistical information Finally data visualization and evidence presentation techniques are covered to help you properly communicate your findings to any audience Style and approachThis book is a complete guide that follows every step of the forensic analysis process in detail You will be guided through each key topic and step necessary to perform an investigation Hands on exercises are presented throughout the book and technical reference guides and sample documents are included for real world use Big Data Analytics and Computing for Digital Forensic Investigations Suneeta Satpathy,Sachi Mohanty,2020-03-17 Digital forensics has recently gained a notable development and become the most demanding area in today s information security requirement This book investigates the areas of digital forensics digital investigation and data analysis procedures as they apply to computer fraud and cybercrime with the main objective of describing a variety of digital crimes and retrieving potential digital evidence Big Data Analytics and Computing for Digital Forensic Investigations gives a contemporary view on the problems of information security It presents the idea that protective mechanisms and software must be integrated along with

forensic capabilities into existing forensic software using big data computing tools and techniques Features Describes trends of digital forensics served for big data and the challenges of evidence acquisition Enables digital forensic investigators and law enforcement agencies to enhance their digital investigation capabilities with the application of data science analytics algorithms and fusion technique This book is focused on helping professionals as well as researchers to get ready with next generation security systems to mount the rising challenges of computer fraud and cybercrimes as well as with digital forensic investigations Dr Suneeta Satpathy has more than ten years of teaching experience in different subjects of the Computer Science and Engineering discipline She is currently working as an associate professor in the Department of Computer Science and Engineering College of Bhubaneswar affiliated with Biju Patnaik University and Technology Odisha Her research interests include computer forensics cybersecurity data fusion data mining big data analysis and decision mining Dr Sachi Nandan Mohanty is an associate professor in the Department of Computer Science and Engineering at ICFAI Tech ICFAI Foundation for Higher Education Hyderabad India His research interests include data mining big data analysis cognitive science fuzzy decision making brain computer interface cognition and computational intelligence **Digital Forensics in the Era of Artificial Intelligence** Nour Moustafa,2022-07-18 Digital forensics plays a crucial role in identifying analysing and presenting cyber threats as evidence in a court of law Artificial intelligence particularly machine learning and deep learning enables automation of the digital investigation process This book provides an in depth look at the fundamental and advanced methods in digital forensics It also discusses how machine learning and deep learning algorithms can be used to detect and investigate cybercrimes This book demonstrates digital forensics and cyber investigating techniques with real world applications It examines hard disk analytics and style architectures including Master Boot Record and GUID Partition Table as part of the investigative process It also covers cyberattack analysis in Windows Linux and network systems using virtual machines in real world scenarios Digital Forensics in the Era of Artificial Intelligence will be helpful for those interested in digital forensics and using machine learning techniques in the investigation of cyberattacks and the detection of evidence in cybercrimes Mastering Python Forensics Dr. Michael Spreitzenbarth,Dr. Johann Uhrmann,2015-10-30 Master the art of digital forensics and analysis with Python About This Book Learn to perform forensic analysis and investigations with the help of Python and gain an advanced understanding of the various Python libraries and frameworks Analyze Python scripts to extract metadata and investigate forensic artifacts The writers Dr Michael Spreitzenbarth and Dr Johann Uhrmann have used their experience to craft this hands on guide to using Python for forensic analysis and investigations Who This Book Is For If you are a network security professional or forensics analyst who wants to gain a deeper understanding of performing forensic analysis with Python then this book is for you Some Python experience would be helpful What You Will Learn Explore the forensic analysis of different platforms such as Windows Android and vSphere Semi automatically reconstruct major parts of the system activity and time line Leverage Python ctypes for protocol decoding Examine artifacts

from mobile Skype and browsers Discover how to utilize Python to improve the focus of your analysis Investigate in volatile memory with the help of volatility on the Android and Linux platforms In Detail Digital forensic analysis is the process of examining and extracting data digitally and examining it Python has the combination of power expressiveness and ease of use that makes it an essential complementary tool to the traditional off the shelf digital forensic tools This book will teach you how to perform forensic analysis and investigations by exploring the capabilities of various Python libraries The book starts by explaining the building blocks of the Python programming language especially ctypes in depth along with how to automate typical tasks in file system analysis common correlation tasks to discover anomalies as well as templates for investigations Next we ll show you cryptographic algorithms that can be used during forensic investigations to check for known files or to compare suspicious files with online services such as VirusTotal or Mobile Sandbox Moving on you ll learn how to sniff on the network generate and analyze network flows and perform log correlation with the help of Python scripts and tools You ll get to know about the concepts of virtualization and how virtualization influences IT forensics and you ll discover how to perform forensic analysis of a jailbroken rooted mobile device that is based on iOS or Android Finally the book teaches you how to analyze volatile memory and search for known malware samples based on YARA rules Style and approach This easy to follow guide will demonstrate forensic analysis techniques by showing you how to solve real word scenarios step by step

Network Security Strategies Aditya Mukherjee,2020-11-06 Build a resilient network and prevent advanced cyber attacks and breaches Key Features Explore modern cybersecurity techniques to protect your networks from ever evolving cyber threats Prevent cyber attacks by using robust cybersecurity strategies Unlock the secrets of network security Book Description With advanced cyber attacks severely impacting industry giants and the constantly evolving threat landscape organizations are adopting complex systems to maintain robust and secure environments Network Security Strategies will help you get well versed with the tools and techniques required to protect any network environment against modern cyber threats You ll understand how to identify security vulnerabilities across the network and how to effectively use a variety of network security techniques and platforms Next the book will show you how to design a robust network that provides top notch security to protect against traditional and new evolving attacks With the help of detailed solutions and explanations you ll be able to monitor networks skillfully and identify potential risks Finally the book will cover topics relating to thought leadership and the management aspects of network security By the end of this network security book you ll be well versed in defending your network from threats and be able to consistently maintain operational efficiency security and privacy in your environment What you will learn Understand network security essentials including concepts mechanisms and solutions to implement secure networks Get to grips with setting up and threat monitoring cloud and wireless networks Defend your network against emerging cyber threats in 2020 Discover tools frameworks and best practices for network penetration testing Understand digital forensics to enhance your network security skills Adopt a proactive approach to stay ahead in

network security Who this book is for This book is for anyone looking to explore information security privacy malware and cyber threats Security experts who want to enhance their skill set will also find this book useful A prior understanding of cyber threats and information security will help you understand the key concepts covered in the book more effectively

Forensic Innovations in Criminal Investigations Nishchal Soni,2025-04-17 Forensic science continues to evolve at a remarkable pace standing at the crossroads of innovation and justice As new technologies emerge and investigative challenges grow more complex the field must adapt pushing boundaries and embracing fresh perspectives Forensic Innovations in Criminal Investigations brings together a collection of work that highlights just how dynamic and multidisciplinary forensic science has become This book is the result of the dedication knowledge and collaborative spirit of its contributors Each chapter delves into a specialized area ranging from forensic palynology and next generation DNA sequencing to forensic epigenetics IoT applications and the use of augmented and virtual reality in investigations These topics have been thoughtfully presented to make cutting edge science both accessible and relevant not just for students and researchers but also for professionals in the field The consistent structure across chapters ensures clarity making it easier for readers from diverse backgrounds to engage with complex ideas Whether you re preparing for exams keeping up with the latest advancements or exploring interdisciplinary approaches to forensic investigation this book offers valuable insights and practical guidance As the editor I feel honored to have worked with such talented authors whose contributions make this compilation both meaningful and impactful I extend my heartfelt thanks to each of them for their hard work research and commitment to advancing forensic science I m also grateful to my organization and mentors for supporting me throughout the editorial process and to my family colleagues and peers for their constant encouragement It is my sincere hope that this book will not only inform but also inspire to ignite curiosity encourage innovation and serve as a useful resource for all those committed to uncovering the truth and delivering justice **Big Digital Forensic Data** Darren Quick,Kim-Kwang Raymond Choo,2018-04-24 This book provides an in depth understanding of big data challenges to digital forensic investigations also known as big digital forensic data It also develops the basis of using data mining in big forensic data analysis including data reduction knowledge management intelligence and data mining principles to achieve faster analysis in digital forensic investigations By collecting and assembling a corpus of test data from a range of devices in the real world it outlines a process of big data reduction and evidence and intelligence extraction methods Further it includes the experimental results on vast volumes of real digital forensic data The book is a valuable resource for digital forensic practitioners researchers in big data cyber threat hunting and intelligence data mining and other related areas Cyber and Digital Forensic Investigations Nhien-An Le-Khac,Kim-Kwang Raymond Choo,2020-07-25 Understanding the latest capabilities in the cyber threat landscape as well as the cyber forensic challenges and approaches is the best way users and organizations can prepare for potential negative events Adopting an experiential learning approach this book describes how cyber forensics

researchers educators and practitioners can keep pace with technological advances and acquire the essential knowledge and skills ranging from IoT forensics malware analysis and CCTV and cloud forensics to network forensics and financial investigations Given the growing importance of incident response and cyber forensics in our digitalized society this book will be of interest and relevance to researchers educators and practitioners in the field as well as students wanting to learn about cyber forensics Handbook of Big Data and IoT Security Ali Dehghantanha,Kim-Kwang Raymond Choo,2019-03-22 This handbook provides an overarching view of cyber security and digital forensic challenges related to big data and IoT environment prior to reviewing existing data mining solutions and their potential application in big data context and existing authentication and access control for IoT devices An IoT access control scheme and an IoT forensic framework is also presented in this book and it explains how the IoT forensic framework can be used to guide investigation of a popular cloud storage service A distributed file system forensic approach is also presented which is used to guide the investigation of Ceph Minecraft a Massively Multiplayer Online Game and the Hadoop distributed file system environment are also forensically studied and their findings reported in this book A forensic IoT source camera identification algorithm is introduced which uses the camera s sensor pattern noise from the captured image In addition to the IoT access control and forensic frameworks this handbook covers a cyber defense triage process for nine advanced persistent threat APT groups targeting IoT infrastructure namely APT1 Molerats Silent Chollima Shell Crew NetTraveler ProjectSauron CopyKittens Volatile Cedar and Transparent Tribe The characteristics of remote controlled real world Trojans using the Cyber Kill Chain are also examined It introduces a method to leverage different crashes discovered from two fuzzing approaches which can be used to enhance the effectiveness of fuzzers Cloud computing is also often associated with IoT and big data e g cloud enabled IoT systems and hence a survey of the cloud security literature and a survey of botnet detection approaches are presented in the book Finally game security solutions are studied and explained how one may circumvent such solutions This handbook targets the security privacy and forensics research community and big data research community including policy makers and government agencies public and private organizations policy makers Undergraduate and postgraduate students enrolled in cyber security and forensic programs will also find this handbook useful as a reference **Security and Privacy for Big Data, Cloud Computing and Applications** Wei Ren,Lizhe Wang,Kim-Kwang Raymond Choo,Fatos Xhafa,2019-08-14 As big data becomes increasingly pervasive and cloud computing utilization becomes the norm the security and privacy of our systems and data becomes more critical with emerging security and privacy threats and challenges This book presents a comprehensive view on how to advance security and privacy in big data cloud computing and their applications Topics include cryptographic tools SDN security big data security in IoT privacy preserving in big data security architecture based on cyber kill chain privacy aware digital forensics trustworthy computing privacy verification based on machine learning and chaos based communication systems This book is an essential reading for networking computing and communications

professionals researchers students and engineers working with big data and cloud computing **ADVANCED DIGITAL FORENSICS** Diego Rodrigues,2024-11-01 ADVANCED DIGITAL FORENSICS Techniques and Technologies for 2024 is the definitive guide for professionals and students who want to delve deeper into digital forensic analysis This book offers a comprehensive and practical approach covering everything from fundamentals to the most advanced techniques with a focus on emerging technologies and threats in 2024 Written by Diego Rodrigues a renowned consultant and author with extensive experience in market intelligence technology and innovation this book stands out for its updated and practical approach With 42 international certifications from institutions such as IBM Google Microsoft AWS Cisco Boston University EC Council Palo Alto and META Rodrigues brings a wealth of knowledge and insights to readers About the Book Solid Fundamentals Begin with the basic principles of digital forensics establishing a robust foundation for advancing into more complex topics Modern Tools and Techniques Learn to use the latest and most effective tools such as Wireshark Splunk Cellebrite and Magnet AXIOM to capture and analyze critical data Forensics in Complex Environments Explore the challenges and solutions for forensic analysis in modern networks IoT devices and cloud environments Advanced Threat Analysis Understand how to investigate sophisticated attacks including APTs and ransomware using artificial intelligence and machine learning Practical Cases and Real Applications Apply the knowledge gained in detailed case studies that reflect real world scenarios and challenges faced by security professionals Recommended Practices Follow best practices to ensure the integrity of evidence legal compliance and effectiveness in investigations Advanced Digital Forensics Techniques and Technologies for 2024 is an indispensable resource for anyone looking to excel in the field of cybersecurity and digital forensics Equipped with updated knowledge and recommended practices you will be prepared to face the complex challenges of the modern digital world Get your copy today and elevate your forensic skills to the next level TAGS Digital Forensics Blockchain Cryptocurrencies Ransomware APTs Machine Learning Artificial Intelligence SIEM EDR Splunk Wireshark Cellebrite Magnet AXIOM Cloud Forensics AWS Azure Google Cloud Mobile Device Forensics IoT Cybersecurity Digital Investigation Network Forensic Analysis Tools Techniques Python Automation Tools SOAR Darktrace Critical Infrastructure Security Malware Analysis Blockchain Explorer Chainalysis Elliptic Audit Logs Data Recovery Techniques Reverse Engineering Cyber Threat Intelligence Tech Writing Storytelling Tech Book 2024 Python Java Linux Kali Linux HTML ASP NET Ada Assembly Language BASIC Borland Delphi C C C CSS Cobol Compilers DHTML Fortran General HTML Java JavaScript LISP PHP Pascal Perl Prolog RPG Ruby SQL Swift UML Elixir Haskell VBScript Visual Basic XHTML XML XSL Django Flask Ruby on Rails Angular React Vue js Node js Laravel Spring Hibernate NET Core Express js TensorFlow PyTorch Jupyter Notebook Keras Bootstrap Foundation jQuery SASS LESS Scala Groovy MATLAB R Objective C Rust Go Kotlin TypeScript Elixir Dart SwiftUI Xamarin React Native NumPy Pandas SciPy Matplotlib Seaborn D3 js OpenCV NLTK PySpark BeautifulSoup Scikit learn XGBoost CatBoost LightGBM FastAPI Celery Tornado Redis RabbitMQ Kubernetes Docker Jenkins Terraform Ansible Vagrant GitHub

GitLab CircleCI Travis CI Linear Regression Logistic Regression Decision Trees Random Forests FastAPI AI ML K Means Clustering Support Vector Tornado Machines Gradient Boosting Neural Networks LSTMs CNNs GANs ANDROID IOS MACOS WINDOWS Nmap Metasploit Framework Wireshark Aircrack ng John the Ripper Burp Suite SQLmap Maltego Autopsy Volatility IDA Pro OllyDbg YARA Snort ClamAV iOS Netcat Tcpdump Foremost Cuckoo Sandbox Fierce HTTrack Kismet Hydra Nikto OpenVAS Nessus ZAP Radare2 Binwalk GDB OWASP Amass Dnsenum Dirbuster Wpscan Responder Setoolkit Searchsploit Recon ng BeEF aws google cloud ibm azure databricks nvidia meta x Power BI IoT CI CD Hadoop Spark Pandas NumPy Dask SQLAlchemy web scraping mysql big data science openai chatgpt Handler RunOnUiThread Qiskit Q Cassandra Bigtable VIRUS MALWARE docker kubernetes Kali Linux Nmap Metasploit Wireshark information security pen test cybersecurity Linux distributions ethical hacking vulnerability analysis system exploration wireless attacks web application security malware analysis social engineering Android iOS Social Engineering Toolkit SET computer science IT professionals cybersecurity careers cybersecurity expertise cybersecurity library cybersecurity training Linux operating systems cybersecurity tools ethical hacking tools security testing penetration test cycle security concepts mobile security cybersecurity fundamentals cybersecurity techniques cybersecurity skills cybersecurity industry global cybersecurity trends Kali Linux tools cybersecurity education cybersecurity innovation penetration test tools cybersecurity best practices global cybersecurity companies cybersecurity solutions IBM Google Microsoft AWS Cisco Oracle cybersecurity consulting cybersecurity framework network security cybersecurity courses cybersecurity tutorials Linux security cybersecurity challenges cybersecurity landscape cloud security cybersecurity threats cybersecurity compliance cybersecurity research cybersecurity technology **Big Digital Forensic Data** Darren Quick,Kim-Kwang Raymond Choo,2018-06-12 This book provides an in depth understanding of big data challenges to digital forensic investigations also known as big digital forensic data It also develops the basis of using data mining in big forensic data analysis including data reduction knowledge management intelligence and data mining principles to achieve faster analysis in digital forensic investigations By collecting and assembling a corpus of test data from a range of devices in the real world it outlines a process of big digital forensic data analysis for evidence and intelligence It includes the results of experiments on vast volumes of real digital forensic data The book is a valuable resource for digital forensic practitioners researchers in big data cyber threat hunting and intelligence data mining and other related areas **Digital Forensic Education** Xiaolu Zhang,Kim-Kwang Raymond Choo,2019-07-24 In this book the editors explain how students enrolled in two digital forensic courses at their institution are exposed to experiential learning opportunities where the students acquire the knowledge and skills of the subject matter while also learning how to adapt to the ever changing digital forensic landscape Their findings e g forensic examination of different IoT devices are also presented in the book Digital forensics is a topic of increasing importance as our society becomes smarter with more of the things around us been internet and inter connected e g Internet of Things IoT and smart home devices thus

the increasing likelihood that we will need to acquire data from these things in a forensically sound manner This book is of interest to both digital forensic educators and digital forensic practitioners as well as students seeking to learn about digital forensics *Learning Python for Forensics* Preston Miller,Chapin Bryce,2019-01-31 Design develop and deploy innovative forensic solutions using Python Key FeaturesDiscover how to develop Python scripts for effective digital forensic analysisMaster the skills of parsing complex data structures with Python librariesSolve forensic challenges through the development of practical Python scriptsBook Description Digital forensics plays an integral role in solving complex cybercrimes and helping organizations make sense of cybersecurity incidents This second edition of Learning Python for Forensics illustrates how Python can be used to support these digital investigations and permits the examiner to automate the parsing of forensic artifacts to spend more time examining actionable data The second edition of Learning Python for Forensics will illustrate how to develop Python scripts using an iterative design Further it demonstrates how to leverage the various built in and community sourced forensics scripts and libraries available for Python today This book will help strengthen your analysis skills and efficiency as you creatively solve real world problems through instruction based tutorials By the end of this book you will build a collection of Python scripts capable of investigating an array of forensic artifacts and master the skills of extracting metadata and parsing complex data structures into actionable reports Most importantly you will have developed a foundation upon which to build as you continue to learn Python and enhance your efficacy as an investigator What you will learnLearn how to develop Python scripts to solve complex forensic problemsBuild scripts using an iterative designDesign code to accommodate present and future hurdlesLeverage built in and community sourced librariesUnderstand the best practices in forensic programmingLearn how to transform raw data into customized reports and visualizationsCreate forensic frameworks to automate analysis of multiple forensic artifactsConduct effective and efficient investigations through programmatic processingWho this book is for If you are a forensics student hobbyist or professional seeking to increase your understanding in forensics through the use of a programming language then Learning Python for Forensics is for you You are not required to have previous experience in programming to learn and master the content within this book This material created by forensic professionals was written with a unique perspective and understanding for examiners who wish to learn programming **Handbook of Big Data Analytics and Forensics** Kim-Kwang Raymond Choo,Ali Dehghantanha,2021-12-02 This handbook discusses challenges and limitations in existing solutions and presents state of the art advances from both academia and industry in big data analytics and digital forensics The second chapter comprehensively reviews IoT security privacy and forensics literature focusing on IoT and unmanned aerial vehicles UAVs The authors propose a deep learning based approach to process cloud s log data and mitigate enumeration attacks in the third chapter The fourth chapter proposes a robust fuzzy learning model to protect IT based infrastructure against advanced persistent threat APT campaigns Advanced and fair clustering approach for industrial data which is capable of training with

huge volume of data in a close to linear time is introduced in the fifth chapter as well as offering an adaptive deep learning model to detect cyberattacks targeting cyber physical systems CPS covered in the sixth chapter The authors evaluate the performance of unsupervised machine learning for detecting cyberattacks against industrial control systems ICS in chapter 7 and the next chapter presents a robust fuzzy Bayesian approach for ICS s cyber threat hunting This handbook also evaluates the performance of supervised machine learning methods in identifying cyberattacks against CPS The performance of a scalable clustering algorithm for CPS s cyber threat hunting and the usefulness of machine learning algorithms for MacOS malware detection are respectively evaluated This handbook continues with evaluating the performance of various machine learning techniques to detect the Internet of Things malware The authors demonstrate how MacOSX cyberattacks can be detected using state of the art machine learning models In order to identify credit card frauds the fifteenth chapter introduces a hybrid model In the sixteenth chapter the editors propose a model that leverages natural language processing techniques for generating a mapping between APT related reports and cyber kill chain A deep learning based approach to detect ransomware is introduced as well as a proposed clustering approach to detect IoT malware in the last two chapters This handbook primarily targets professionals and scientists working in Big Data Digital Forensics Machine Learning Cyber Security Cyber Threat Analytics and Cyber Threat Hunting as a reference book Advanced level students and researchers studying and working in Computer systems Computer networks and Artificial intelligence will also find this reference useful

Handbook of Research on Network Forensics and Analysis Techniques Shrivastava, Gulshan,Kumar, Prabhat,Gupta, B. B.,Bala, Suman,Dey, Nilanjan,2018-04-06 With the rapid advancement in technology myriad new threats have emerged in online environments The broad spectrum of these digital risks requires new and innovative methods for protection against cybercrimes The Handbook of Research on Network Forensics and Analysis Techniques is a current research publication that examines the advancements and growth of forensic research from a relatively obscure tradecraft to an important part of many investigations Featuring coverage on a broad range of topics including cryptocurrency hand based biometrics and cyberterrorism this publication is geared toward professionals computer forensics practitioners engineers researchers and academics seeking relevant research on the development of forensic tools *Aiding Forensic Investigation Through Deep Learning and Machine Learning Frameworks* Raj, Alex Noel Joseph,Mahesh, Vijayalakshmi G. V.,Nerssison, Ruban,Yu, Ang,Gentry, Jennifer,2022-06-24 It is crucial that forensic science meets challenges such as identifying hidden patterns in data validating results for accuracy and understanding varying criminal activities in order to be authoritative so as to hold up justice and public safety Artificial intelligence with its potential subsets of machine learning and deep learning has the potential to transform the domain of forensic science by handling diverse data recognizing patterns and analyzing interpreting and presenting results Machine Learning and deep learning frameworks with developed mathematical and computational tools facilitate the investigators to provide reliable results Further study on the potential uses of these

technologies is required to better understand their benefits Aiding Forensic Investigation Through Deep Learning and Machine Learning Frameworks provides an outline of deep learning and machine learning frameworks and methods for use in forensic science to produce accurate and reliable results to aid investigation processes The book also considers the challenges developments advancements and emerging approaches of deep learning and machine learning Covering key topics such as biometrics augmented reality and fraud investigation this reference work is crucial for forensic scientists law enforcement computer scientists researchers scholars academicians practitioners instructors and students **Confluence of AI, Machine, and Deep Learning in Cyber Forensics** Misra, Sanjay,Arumugam, Chamundeswari,Jaganathan, Suresh,S., Saraswathi,2020-12-18 Developing a knowledge model helps to formalize the difficult task of analyzing crime incidents in addition to preserving and presenting the digital evidence for legal processing The use of data analytics techniques to collect evidence assists forensic investigators in following the standard set of forensic procedures techniques and methods used for evidence collection and extraction Varieties of data sources and information can be uniquely identified physically isolated from the crime scene protected stored and transmitted for investigation using AI techniques With such large volumes of forensic data being processed different deep learning techniques may be employed Confluence of AI Machine and Deep Learning in Cyber Forensics contains cutting edge research on the latest AI techniques being used to design and build solutions that address prevailing issues in cyber forensics and that will support efficient and effective investigations This book seeks to understand the value of the deep learning algorithm to handle evidence data as well as the usage of neural networks to analyze investigation data Other themes that are explored include machine learning algorithms that allow machines to interact with the evidence deep learning algorithms that can handle evidence acquisition and preservation and techniques in both fields that allow for the analysis of huge amounts of data collected during a forensic investigation This book is ideally intended for forensics experts forensic investigators cyber forensic practitioners researchers academicians and students interested in cyber forensics computer science and engineering information technology and electronics and communication **Digital Forensics and Forensic Investigations: Breakthroughs in Research and Practice** Management Association, Information Resources,2020-04-03 As computer and internet technologies continue to advance at a fast pace the rate of cybercrimes is increasing Crimes employing mobile devices data embedding mining systems computers network communications or any malware impose a huge threat to data security while cyberbullying cyberstalking child pornography and trafficking crimes are made easier through the anonymity of the internet New developments in digital forensics tools and an understanding of current criminal activities can greatly assist in minimizing attacks on individuals organizations and society as a whole Digital Forensics and Forensic Investigations Breakthroughs in Research and Practice addresses current challenges and issues emerging in cyber forensics and new investigative tools and methods that can be adopted and implemented to address these issues and counter security breaches

within various organizations It also examines a variety of topics such as advanced techniques for forensic developments in computer and communication link environments and legal perspectives including procedures for cyber investigations standards and policies Highlighting a range of topics such as cybercrime threat detection and forensic science this publication is an ideal reference source for security analysts law enforcement lawmakers government officials IT professionals researchers practitioners academicians and students currently investigating the up and coming aspects surrounding network security computer science and security engineering

Unveiling the Energy of Verbal Art: An Mental Sojourn through **Big Data Forensics Learning Hadoop Investigations**

In some sort of inundated with displays and the cacophony of quick interaction, the profound energy and mental resonance of verbal art usually fade in to obscurity, eclipsed by the continuous assault of sound and distractions. However, nestled within the lyrical pages of **Big Data Forensics Learning Hadoop Investigations**, a interesting work of literary elegance that pulses with organic feelings, lies an unique journey waiting to be embarked upon. Written by way of a virtuoso wordsmith, that mesmerizing opus instructions viewers on a mental odyssey, delicately exposing the latent possible and profound affect embedded within the delicate web of language. Within the heart-wrenching expanse with this evocative analysis, we will embark upon an introspective exploration of the book is central styles, dissect their captivating writing type, and immerse ourselves in the indelible effect it leaves upon the depths of readers souls.

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