Bitcoin And Blockchain Security

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Cyber Security - Xiaochun Yun 2019-01-01
This open access book constitutes the refereed proceedings of the 15th International Annual Conference on Cyber Security, CNCERT 2018, held in Beijing, China, in August 2018. The 14 full papers presented were carefully reviewed and selected from 53 submissions. The papers cover the following topics: emergency response, mobile internet security, IoT security, cloud security, threat intelligence analysis, vulnerability, artificial intelligence security, IPv6 risk research, cybersecurity policy and regulation research, big data analysis and industrial security.

Recent Trends in Blockchain for Information Systems Security and Privacy - Amit Kumar Tyagi 2021-11-22
Blockchain technology is an emerging distributed, decentralized architecture and computing paradigm, which has accelerated the development and application of cloud, fog and edge computing; artificial intelligence; cyber physical systems; social networking; crowdsourcing and crowdsensing; 5g; trust management and finance; and other many useful sectors. Nowadays, the primary blockchain technology uses are in information systems to keep information secure and private. However, many threats and vulnerabilities are facing blockchain in the past decade such 51% attacks, double spending attacks, etc. The popularity and rapid development of blockchain brings many technical and regulatory challenges for research and academic communities. The main goal of this book is to encourage both researchers and practitioners of Blockchain technology to share and exchange their experiences and recent studies between academia and industry. The reader will be provided with the most up-to-date knowledge of blockchain in mainstream areas of security and privacy in the decentralized domain, which is timely and essential (this is due to the fact that the distributed and p2p applications are increasing day-by-day, and the attackers adopt new mechanisms to threaten the security and privacy of the users in those environments). This book provides a detailed explanation of security and privacy with respect to blockchain for information systems, and will be an essential resource for students, researchers and scientists studying blockchain uses in information systems and those wanting to explore the current state of play.

Cryptocurrencies and Blockchain Technology Applications - Gulshan Shrivastava 2020-06-30
As we enter the Industrial Revolution 4.0, demands for an increasing degree of trust and privacy protection continue to be voiced. The development of blockchain technology is very important because it can help frictionless and transparent financial transactions and improve the business experience, which in turn has far-reaching effects for economic, psychological, educational and organizational improvements in the way we work, teach, learn and care for ourselves and each other. Blockchain is an eccentric technology, but at the same time, the least understood and most disruptive technology of the day. This book covers the latest technologies of cryptocurrencies and blockchain technology and their applications. This book discusses the blockchain and cryptocurrencies related issues and also explains how to provide the security differently through an algorithm, framework, approaches, techniques and mechanisms. A comprehensive understanding of what blockchain is and how it works, as well as insights into how it will affect the future of your organization and industry as a whole and how to integrate blockchain technology into your business strategy. In addition, the book explores the blockchain and its with other technologies like Internet of Things, big data and artificial intelligence, etc.

Blockchain and Web3 - Winston Ma 2022-08-19
An in-depth and authoritative treatment of one of the most pressing topics of our time In Blockchain and Web3: Building the Cryptocurrency, Privacy, and Security Foundations of the Metaverse, two tech and finance experts deliver a comprehensive and accessible guide to the present and future of blockchain technology and how it will form the foundation of a new, better internet. To support a concept as bold as the

Metaverse, we need several orders of magnitude more powerful computing capability, accessible at much lower latencies, across a multitude of devices and screens. You'll discover how blockchain can accelerate data flow, exchange, and transactions to create and transfer value around the world and, at the same time, how it can be used to protect user data privacy and security with decentralized web infrastructures. The book also includes: Discussions of how sovereign governments are entering the blockchain fray and how their entry, especially with CBDC digital currency, shapes the conversations around Web3 Explorations of whether we will ever realize the holy grail of blockchain tech: interoperability to compete with Big Tech platforms Discussion of new security and privacy issues rising from the intersection of Blockchain, Web3 and Metaverse.A fascinating and eye-opening treatment of the past, present, and future of blockchain and the role it will play on the internet and metaverse, Blockchain and Web3 is a truly original and engaging discussion of a timely and critical topic.

Blockchain Technology and the Internet of Things - Rashmi Agrawal 2020-12-30
This new volume looks at the electrifying world of blockchain technology and how it has been revolutionizing the Internet of Things and cyber-physical systems. Aimed primarily at business users and developers who are considering blockchain-based projects, the volume provides a comprehensive introduction to the theoretical and practical aspects of blockchain technology. It presents a selection of chapters on topics that cover new information on blockchain and bitcoin security, IoT security threats and attacks, privacy issues, fault-tolerance mechanisms, and more. Some major software packages are discussed, and it also addresses the legal issues currently affecting the field. The information presented here is relevant to current and future problems relating to blockchain technology and will provide the tools to build efficient decentralized applications. Blockchain technology and the IoT can profoundly change how the world—and businesses—work, and this book provides a window into the current world of blockchain. No longer limited to just Bitcoin, blockchain technology has spread into many sectors and into a significant number of different technologies.

Securing Blockchain Networks like Ethereum and Hyperledger Fabric - Alessandro Parisi 2020-04-13
Build secure private blockchain networks to handle mission-critical security challenges such as denial-of-service attacks, user wallets, and pool mining attacks Key FeaturesExplore blockchain concepts such as cryptography, consensus algorithms, and security assumptionsArchitect network security for mission-critical decentralized apps (Dapps) using design security considerationsConsider various deployment and operational aspects while building a blockchain networkBook Description Blockchain adoption has extended from niche research to everyday usage. However, despite the blockchain revolution, one of the key challenges faced in blockchain development is maintaining security, and this book will demonstrate the techniques for doing this. You'll start with blockchain basics and explore various blockchain attacks on user wallets, and denial of service and pool mining attacks. Next, you'll learn cryptography concepts, consensus algorithms in blockchain security, and design principles while understanding and deploying security implementation guidelines. You'll not only cover architectural considerations, but also work on system and network security and operational configurations for your Ethereum and Hyperledger Fabric network. You'll later implement security at each level of blockchain app development, understanding how to secure various phases of a blockchain app using an example-based approach. You'll gradually learn to securely implement and develop decentralized apps, and follow deployment best practices. Finally, you'll explore the architectural components of Hyperledger Fabric, and how they can be configured to build secure private blockchain networks. By the end of this book, you'll have learned blockchain security concepts and techniques that you can

implement in real blockchain production environments. What you will learnUnderstand blockchain consensus algorithms and security assumptionsDesign secure distributed applications and smart contractsUnderstand how blockchains manage transactions and help to protect wallets and private keysPrevent potential security threats that can affect distributed ledger technologies (DLTs) and blockchainsUse pentesting tools for assessing potential flaws in Dapps and smart contractsAssess privacy compliance issues and manage sensitive data with blockchainWho this book is for This book is for blockchain developers, security professionals, and Ethereum and Hyperledger developers who are looking to implement security in blockchain platforms and ensure secure data management using an example-driven approach. Basic knowledge of blockchain concepts will be beneficial.

Mastering Bitcoin - Andreas M. Antonopoulos 2017-06-12
Join the technological revolution that's taking the financial world by storm. Mastering Bitcoin is your guide through the seemingly complex world of bitcoin, providing the knowledge you need to participate in the internet of money. Whether you're building the next killer app, investing in a startup, or simply curious about the technology, this revised and expanded second edition provides essential detail to get you started. Bitcoin, the first successful decentralized digital currency, is still in its early stages and yet it's already spawned a multi-billion-dollar global economy open to anyone with the knowledge and passion to participate. Mastering Bitcoin provides the knowledge. You simply supply the passion. The second edition includes: A broad introduction of bitcoin and its underlying blockchain—ideal for non-technical users, investors, and business executives An explanation of the technical foundations of bitcoin and cryptographic currencies for developers, engineers, and software and systems architects Details of the bitcoin decentralized network, peer-to-peer architecture, transaction lifecycle, and security principles New developments such as Segregated Witness, Payment Channels, and Lightning Network A deep dive into blockchain applications, including how to combine the building blocks offered by this platform into higher-level applications User stories, analogies, examples, and code snippets illustrating key technical concepts

Hands-On Cybersecurity with Blockchain - Rajneesh Gupta 2018-06-28
Develop blockchain application with step-by-step instructions, working example and helpful recommendations Key Features Understanding the blockchain technology from the cybersecurity perspective Developing cyber security solutions with Ethereum blockchain technology Understanding real-world deployment of blockchain based applications Book Description Blockchain technology is being welcomed as one of the most revolutionary and impactful innovations of today. Blockchain technology was first identified in the world's most popular digital currency, Bitcoin, but has now changed the outlook of several organizations and empowered them to use it even for storage and transfer of value. This book will start by introducing you to the common cyberthreat landscape and common attacks such as malware, phishing, insider threats, and DDoS. The next set of chapters will help you to understand the workings of Blockchain technology, Ethereum and Hyperledger architecture and how they fit into the cybersecurity ecosystem. These chapters will also help you to write your first distributed application on Ethereum Blockchain and the Hyperledger Fabric framework. Later, you will learn about the security triad and its adaptation with Blockchain. The last set of chapters will take you through the core concepts of cybersecurity, such as DDoS protection, PKI-based identity, 2FA, and DNS security. You will learn how Blockchain plays a crucial role in transforming cybersecurity solutions. Toward the end of the book, you will also encounter some real-world deployment examples of Blockchain in security cases, and also understand the short-term challenges and future of cybersecurity with Blockchain. What you will learn Understand the cyberthreat landscape Learn about Ethereum and Hyperledger Blockchain Program Blockchain solutions Build Blockchain-based apps for 2FA, and DDoS protection Develop Blockchain-based PKI solutions and apps for storing DNS entries Challenges and the future of cybersecurity and Blockchain Who this book is for The book is targeted towards security professionals, or any stakeholder dealing with cybersecurity who wants to understand the next-level of securing infrastructure using Blockchain. Basic understanding of Blockchain can be an added advantage.

Blockchain - Harvard Business Review 2019
Can blockchain solve your biggest business problem? While news outlets are transfixed with Bitcoin's latest swings, your most forward-looking competitors are tuning out the noise and quietly making key bets on blockchain. They're effortlessly tracking every last link in their supply chains. They're making bureaucratic paper trails obsolete while keeping their customers' data safer. And they're imagining new ways to use this next foundational technology to sustain their competitive advantage. What should you be doing right now to ensure that your business is poised for success? These articles by blockchain experts and consultants will help you understand today's most essential thinking on what blockchain is capable of now, how to adopt it in your organization, and how the technology is likely to be used in the near future and beyond. Blockchain: The Insights You Need from Harvard Business Review will help you spearhead important conversations, get going on the right blockchain initiatives in your company, and capitalize on the opportunity of the coming blockchain wave. Catch up on current topics and deepen your understanding of them with the Insights You Need series from Harvard Business Review. Featuring some of HBR's best and most recent thinking, Insights You Need titles are both a primer on today's most pressing issues and an extension of the conversation, with interesting research, interviews, case studies, and practical ideas to help you explore how a particular issue will impact your company and what it will mean for you and your business.

Blockchain Security in Cloud Computing - K.M. Baalamurugan 2021-08-12
This book explores the concepts and techniques of cloud security using blockchain. Also discussed is the possibility of applying blockchain to provide security in various domains. The authors discuss how blockchain holds the potential to significantly increase data privacy and security while boosting accuracy and integrity in cloud data. The specific highlight of this book is focused on the application of integrated technologies in enhancing cloud security models, use cases, and its challenges. The contributors, both from academia and industry, present their technical evaluation and comparison with existing technologies. This book pertains to IT professionals, researchers, and academicians towards fourth revolution technologies.

Blockchain for Information Security and Privacy - Udai Pratap Rao 2021-12-01
Distributed and peer-to-peer (P2P) applications are increasing daily, and cyberattacks are constantly adopting new mechanisms to threaten the security and privacy of users in these Internet of Things (IoT) environments. Blockchain, a decentralized cryptographic-based technology, is a promising element for IoT security in manufacturing, finance, healthcare, supply chain, identity management, e-governance, defence, education, banking, and trading. Blockchain has the potential to secure IoT through repetition, changeless capacity, and encryption. Blockchain for Information Security and Privacy provides essential knowledge of blockchain usage in the mainstream areas of security, trust, and privacy in decentralized domains. This book is a source of technical information regarding blockchain-oriented software and applications. It provides tools to researchers and developers in both computing and software engineering to develop solutions and automated systems that can promote security, trust, and privacy in cyberspace. FEATURES Applying blockchain-based secured data management in confidential cyberdefense applications Securing online voting systems using blockchain Safeguarding electronic healthcare record (EHR) management using blockchain Impacting security and privacy in digital identity management Using blockchain-based security and privacy for smart contracts By providing an overview of blockchain technology application domains in IoT (e.g., vehicle web, power web, cloud internet, and edge computing), this book features side-by-side comparisons of modern methods toward secure and privacy-preserving blockchain technology. It also examines safety objectives, efficiency, limitations, computational complexity, and communication overhead of various applications using blockchain. This book also addresses the combination of blockchain and industrial IoT. It explores novel various-levels of information sharing systems.

Handbook of Research on Smart Technology Models for Business and Industry - Thomas, J. Joshua 2020-06-19
Advances in machine learning techniques and ever-increasing computing power has helped create a new generation of hardware and software technologies with practical applications for nearly every industry. As the progress has, in turn, excited the interest of venture investors, technology firms, and a growing number of clients, implementing intelligent automation in both physical and information systems has become a must in business. Handbook of Research on Smart Technology Models for Business and Industry is an essential reference source that discusses relevant abstract frameworks and the latest experimental

research findings in theory, mathematical models, software applications, and prototypes in the area of smart technologies. Featuring research on topics such as digital security, renewable energy, and intelligence management, this book is ideally designed for machine learning specialists, industrial experts, data scientists, researchers, academicians, students, and business professionals seeking coverage on current smart technology models.

Learn Bitcoin and Blockchain - Kirankalyan Kulkarni 2018-08-31
Get up and running with the fundamentals of Bitcoin and blockchain Key Features Learn quick, effective, and easy ways to master blockchain and Bitcoin Understand the impact of decentralization and discover ways to tackle it Explore the future of Bitcoin and blockchain and implement them in a business network Book Description Blockchain is a distributed database that enables permanent, transparent, and secure storage of data. Blockchain technology uses cryptography to keep data secure. Learn Bitcoin and Blockchain is the perfect entry point to the world of decentralized databases. This book will take you on a journey through the blockchain database, followed by advanced implementations of the blockchain concept. You will learn about Bitcoin basics and their technical operations. As you make your way through the book, you will gain insight into this leading technology and its implementation in the real world. You will also cover the technical foundation of blockchain and understand the fundamentals of cryptography and how they keep data secure. In the concluding chapters, you'll get to grips with the mechanisms behind cryptocurrencies. By the end of this book, you will have learned about decentralized digital money, advanced blockchain concepts, and Bitcoin and blockchain security. What you will learn Understand the concept of decentralization, its impact, its relationship with blockchain technology and its pros and cons Learn blockchain and Bitcoin architectures and security Explore Bitcoin and blockchain security Implement blockchain technology and its features commercially Understand why consensus protocols are critical in blockchain Get a grip on the future of blockchain Who this book is for Learn Bitcoin and Blockchain is for anyone who wants to quickly understand and expand their knowledge of how blockchain and Bitcoin work and how they are applied commercially. No prior knowledge of blockchain and Bitcoin is required.

Blockchain Cybersecurity, Trust and Privacy - Kim-Kwang Raymond Choo 2020-03-02
This book provides the reader with the most up-to-date knowledge of blockchain in mainstream areas of security, trust, and privacy in the decentralized domain, which is timely and essential (this is due to the fact that the distributed and P2P applications is increasing day-by-day, and the attackers adopt new mechanisms to threaten the security and privacy of the users in those environments). This book also provides the technical information regarding blockchain-oriented software, applications, and tools required for the researcher and developer experts in both computing and software engineering to provide solutions and automated systems against current security, trust and privacy issues in the cyberspace. Cybersecurity, trust and privacy (CTP) are pressing needs for governments, businesses, and individuals, receiving the utmost priority for enforcement and improvement in almost any societies around the globe. Rapid advances, on the other hand, are being made in emerging blockchain technology with broadly diverse applications that promise to better meet business and individual needs. Blockchain as a promising infrastructural technology seems to have the potential to be leveraged in different aspects of cybersecurity promoting decentralized cyberinfrastructure. Blockchain characteristics such as decentralization, verifiability and immutability may revolve current cybersecurity mechanisms for ensuring the authenticity, reliability, and integrity of data. Almost any article on the blockchain points out that the cybersecurity (and its derivatives) could be revitalized if it is supported by blockchain technology. Yet, little is known about factors related to decisions to adopt this technology, and how it can systemically be put into use to remedy current CTP's issues in the digital world. Topics of interest for this book include but not limited to: Blockchain-based authentication, authorization and accounting mechanisms Applications of blockchain technologies in digital forensic and threat hunting Blockchain-based threat intelligence and threat analytics techniques Formal specification of smart contracts Automated tools for outsmarting smart contracts Security and privacy aspects of blockchain technologies Vulnerabilities of smart contracts Blockchain for securing cyber infrastructure and internet of things networks Blockchain-based cybersecurity education systems This book provides information for security and privacy experts in all the areas of blockchain,

cryptocurrency, cybersecurity, forensics, smart contracts, computer systems, computer networks, software engineering, applied artificial intelligence for computer security experts, big data analysts, and decentralized systems. Researchers, scientists and advanced level students working in computer systems, computer networks, artificial intelligence, big data will find this book useful as well.

Bitcoin and Blockchain Security - Ghassan O. Karame 2016-09-30
There is a lot of buzz about Bitcoin and Blockchain lately, our expert authors will help to answer some imperative questions about the security involved in this new digital asset and ledger. This comprehensive new resource presents a thorough overview and analysis of the security and privacy provisions of Bitcoin and its underlying blockchain clients. This book goes beyond the analysis of reported vulnerabilities of Bitcoin, evaluating a number of countermeasures to deter threats on the system. Readers are given concrete solutions and recommendations on the best practices to use when relying on Bitcoin as a payment method. This resource provides a clear explanation of assumptions governing the security of Bitcoin, including the scalability measures adopted in Bitcoin, privacy for clients, and the proper means of securing Bitcoin wallets. Readers learn how the security and privacy provisions of other blockchain technologies compare to Bitcoin and the security lessons learned after extensive research of Bitcoin since the inception of the currency.

Blockchain for Cybersecurity and Privacy - Yassine Maleh 2020-08-02
Blockchain technology is defined as a decentralized system of distributed registers that are used to record data transactions on multiple computers. The reason this technology has gained popularity is that you can put any digital asset or transaction in the blocking chain, the industry does not matter. Blockchain technology has infiltrated all areas of our lives, from manufacturing to healthcare and beyond. Cybersecurity is an industry that has been significantly affected by this technology and may be more so in the future. Blockchain for Cybersecurity and Privacy: Architectures, Challenges, and Applications is an invaluable resource to discover the blockchain applications for cybersecurity and privacy. The purpose of this book is to improve the awareness of readers about blockchain technology applications for cybersecurity and privacy. This book focuses on the fundamentals, architectures, and challenges of adopting blockchain for cybersecurity. Readers will discover different applications of blockchain for cybersecurity in IoT and healthcare. The book also includes some case studies of the blockchain for e-commerce online payment, retention payment system, and digital forensics. The book offers comprehensive coverage of the most essential topics, including: Blockchain architectures and challenges Blockchain threats and vulnerabilities Blockchain security and potential future use cases Blockchain for securing Internet of Things Blockchain for cybersecurity in healthcare Blockchain in facilitating payment system security and privacy This book comprises a number of state-of-the-art contributions from both scientists and practitioners working in the fields of blockchain technology and cybersecurity. It aspires to provide a relevant reference for students, researchers, engineers, and professionals working in this particular area or those interested in grasping its diverse facets and exploring the latest advances on the blockchain for cybersecurity and privacy.

The cryptocurrency Bitcoin. Its history, functional principles, security and economic aspects - Mark Strutzenberger 2019-10-24
Pre-University Paper from the year 2019 in the subject Economics - Finance, grade: 1, , language: English, abstract: Are words such as mining, proof-of-work, hash value and ETF alien to you? Do you ask yourself why people buy Bitcoin, governments forbid the use of the currency and banks warn against it? Would you like to get clear and understandable answers? Then you have come to the right place. This book provides an overview of how Bitcoin works, possible risks and opportunities, and what you should consider when investing or mining. Additionally, you will also find an overview of alternative cryptocurrencies, possible applications of blockchain technology in the future and ICOs. Dieses Buch ist auch auf Deutsch unter dem Titel "Die Kryptowährung Bitcoin. Geschichte, Funktionsweise, Sicherheit und Wirtschaftliche Aspekte" verfügbar.

Advanced Blockchain Development - Imran Bashir 2019-05-22
Explore distributed ledger technology, decentralization, and smart contracts and develop real-time decentralized applications with Ethereum and Solidity Key FeaturesGet to grips with the underlying technical principles and implementations of blockchainBuild powerful applications using Ethereum to secure transactions and create smart contractsGain advanced insights into cryptography and

cryptocurrenciesBook Description Blockchain technology is a distributed ledger with applications in industries such as finance, government, and media. This Learning Path is your guide to building blockchain networks using Ethereum, JavaScript, and Solidity. You will get started by understanding the technical foundations of blockchain technology, including distributed systems, cryptography and how this digital ledger keeps data secure. Further into the chapters, you'll gain insights into developing applications using Ethereum and Hyperledger. As you build on your knowledge of Ether security, mining , smart contracts, and Solidity, you'll learn how to create robust and secure applications that run exactly as programmed without being affected by fraud, censorship, or third-party interference. Toward the concluding chapters, you'll explore how blockchain solutions can be implemented in applications such as IoT apps, in addition to its use in currencies. The Learning Path will also highlight how you can increase blockchain scalability and even discusses the future scope of this fascinating and powerful technology. By the end of this Learning Path, you'll be equipped with the skills you need to tackle pain points encountered in the blockchain life cycle and confidently design and deploy decentralized applications. This Learning Path includes content from the following Packt products: Mastering Blockchain - Second Edition by Imran BashirBuilding Blockchain Projects by Narayan PrustyWhat you will learnUnderstand why decentralized applications are importantDiscover the mechanisms behind bitcoin and alternative cryptocurrenciesMaster how cryptography is used to secure data with the help of examplesMaintain, monitor, and manage your blockchain solutionsCreate Ethereum walletsExplore research topics and the future scope of blockchain technologyWho this book is for This Learning Path is designed for blockchain developers who want to build decentralized applications and smart contracts from scratch using Hyperledger. Basic familiarity with any programming language will be useful to get started with this Learning Path.

Financial Cryptography and Data Security - Aviv Zohar 2019-02-09 This book constitutes the refereed proceedings of 3 workshops held at the 22nd International Conference on Financial Cryptography and Data Security, FC 2018, in Nieuwport, Curaçao, in March 2018. The 23 full papers presented together with 2 short papers were carefully reviewed and selected from 52 submissions. They feature the outcome of the 5th Workshop on Bitcoin and Blockchain Research, BITCOIN 2018, the Third Workshop onSecure Voting Systems, VOTING 2018,and the Second Workshop on Trusted Smart Contracts, WTSC 2018. The papers are grouped in topical sections named: Blockchain, Distributed Ledgers, Cryptography, Bitcoin, Voting, and Smart Contracts.

Blockchain Technology Basics - Srikanth Rc Cherukupalli M Tech 2020-01-12 The Blockchain innovation can be another name for the peruses however the specialists have a reliable assessment that because of this innovation we can observe a significant changeover in the field of change. Along these lines, different organizations are looking for right open doors in the area of Blockchain Application Development. The blockchain is a developing innovation so that, the vast majority of the general population don't know about this new headway. On the off chance that you are one of the individuals who wish to have significant learning of the innovation, bear on perusing the data gave underneath

Blockchain Technology and Applications - Ahmed Banafa 2019-08-15 Blockchain is an emerging technology that can radically improve security in transaction network. It provides the basis for a dynamic distributed ledger that can be applied to save time when recording transactions between parties, remove costs associated with intermediaries, and reduce risks of fraud and tampering. This book explores the fundamentals and applications of Blockchain technology--the transparent, secure, immutable and distributed database used currently as the underlying technology for Cryptocurrency. Topics covered in this book: Blockchain technology, Smart contracts, Hashing, SHA-256 Hash, Verification, Validation, Consensus models, Digital Mining, Hard fork, Soft fork, Bitcoin, Ethereum, Proof of work, Proof of stack, Myths about Blockchain, Decentralized peer-to-peer network, Types of Blockchain networks, Hot and Cold Wallets, Double Spend, Decentralized Applications, Transaction networks, Sidechains, 51% attack, Cryptocurrency, Digital transformation, Internet of Things (IoT), Artificial Intelligence (AI), Cybersecurity and the Future of Blockchain.

Bitcoin and Cryptocurrency Technologies - Arvind Narayanan 2016-07-19 An authoritative introduction to the exciting new technologies of digital money Bitcoin and Cryptocurrency Technologies provides a comprehensive introduction to the revolutionary yet often misunderstood new technologies of digital currency. Whether you are a student, software developer, tech entrepreneur, or researcher in computer science, this authoritative and self-contained book tells you everything you need to know about the new global money for the Internet age. How do Bitcoin and its block chain actually work? How secure are your bitcoins? How anonymous are their users? Can cryptocurrencies be regulated? These are some of the many questions this book answers. It begins by tracing the history and development of Bitcoin and cryptocurrencies, and then gives the conceptual and practical foundations you need to engineer secure software that interacts with the Bitcoin network as well as to integrate ideas from Bitcoin into your own projects. Topics include decentralization, mining, the politics of Bitcoin, altcoins and the cryptocurrency ecosystem, the future of Bitcoin, and more. An essential introduction to the new technologies of digital currency Covers the history and mechanics of Bitcoin and the block chain, security, decentralization, anonymity, politics and regulation, altcoins, and much more Features an accompanying website that includes instructional videos for each chapter, homework problems, programming assignments, and lecture slides Also suitable for use with the authors' Coursera online course Electronic solutions manual (available only to professors)

Mastering Bitcoin - Andreas M. Antonopoulos 2014-12-03 Want to join the technological revolution that's taking the world of finance by storm? Mastering Bitcoin is your guide through the seemingly complex world of bitcoin, providing the requisite knowledge to help you participate in the internet of money. Whether you're building the next killer app, investing in a startup, or simply curious about the technology, this practical book is essential reading. Bitcoin, the first successful decentralized digital currency, is still in its infancy and it's already spawned a multi-billion dollar global economy. This economy is open to anyone with the knowledge and passion to participate. Mastering Bitcoin provides you with the knowledge you need (passion not included). This book includes: A broad introduction to bitcoin—ideal for non-technical users, investors, and business executives An explanation of the technical foundations of bitcoin and cryptographic currencies for developers, engineers, and software and systems architects Details of the bitcoin decentralized network, peer-to-peer architecture, transaction lifecycle, and security principles Offshoots of the bitcoin and blockchain inventions, including alternative chains, currencies, and applications User stories, analogies, examples, and code snippets illustrating key technical concepts

Bitcoin - Allan Brito 2021-02-09 In recent years we saw technology making massive changes and disrupting several aspects of our lives. With the internet, we gained a more connected world, and smartphones made that mobile in an unprecedented way. Now, it is time to shake our financial system with the latest revolution and evolution with Bitcoin.Do you know what Bitcoin is and how to use it? It is a digital currency that exists only in computers spread across the world in a Blockchain. The technology behind Bitcoin can disrupt many types of traditional business with better security and efficiency.Suppose you are new to the world of Cryptocurrencies and Bitcoin. In that case, we will give you the information necessary to start using the currency and explain how to manage your digital wallet. You will learn how an exchange works and when you should use them.Here is a list of topics covered in the book: - What is Bitcoin?- The birth of Bitcoin- Bitcoin and cryptography- Bitcoin and privacy- The past and future of Bitcoin pricing- How Bitcoin works- Relation between Bitcoins and the Blockchain- How the Blockchain works- Tools to explore the Blockchain- The irreversible nature of a Blockchain- Security behind a Blockchain- How the cryptocurrency wallet works- Relation between Bitcoins and a wallet- How the Public and Private Keys works- Is Bitcoin a messaging system?- Creating your first wallet- Why not use Bitcoin Core as your wallet?- When to use multiple wallets- How to choose and types of wallets- How to use mnemonic phrases to recover a wallet?- Using Desktop wallets- Using Mobile wallets- Using Web-based wallets- Using hardware wallets- Using paper wallets- How to manage Bitcoins in a wallet- Sending and receiving Bitcoins- Bitcoin fees: How to calculate and estimate fees- The benefits of SegWit transactions- Manipulating fees to change conformation speeds- How mining works?- Should you start mining?- Is it possible to make money mining?- Using an exchange- What is the KYC initiative?- The risks of using an exchange- The Bitcoin security- Private Keys and recovery phrases importance- The weal link in Bitcoin security- How to create a recovery plan- Planning for your heirs- The cryptocurrency ecosystem- How to extend the value of a cryptocurrency- What are stable coins?Are you ready to start using

Bitcoins

Foundations of Blockchain - Koshik Raj 2019-01-29
Learn the foundations of blockchain technology - its core concepts and algorithmic solutions across cryptography, peer-to-peer technology, and game theory. Key FeaturesLearn the core concepts and foundations of the blockchain and cryptocurrenciesUnderstand the protocols and algorithms behind decentralized applicationsMaster how to architect, build, and optimize blockchain applicationsBook Description Blockchain technology is a combination of three popular concepts: cryptography, peer-to-peer networking, and game theory. This book is for anyone who wants to dive into blockchain from first principles and learn how decentralized applications and cryptocurrencies really work. This book begins with an overview of blockchain technology, including key definitions, its purposes and characteristics, so you can assess the full potential of blockchain. All essential aspects of cryptography are then presented, as the backbone of blockchain. For readers who want to study the underlying algorithms of blockchain, you'll see Python implementations throughout. You'll then learn how blockchain architecture can create decentralized applications. You'll see how blockchain achieves decentralization through peer-to-peer networking, and how a simple blockchain can be built in a P2P network. You'll learn how these elements can implement a cryptocurrency such as Bitcoin, and the wider applications of blockchain work through smart contracts. Blockchain optimization techniques, and blockchain security strategies are then presented. To complete this foundation, we consider blockchain applications in the financial and non-financial sectors, and also analyze the future of blockchain. A study of blockchain use cases includes supply chains, payment systems, crowdfunding, and DAOs, which rounds out your foundation in blockchain technology. What you will learnThe core concepts and technical foundations of blockchainThe algorithmic principles and solutions that make up blockchain and cryptocurrenciesBlockchain cryptography explained in detailHow to realize blockchain projects with hands-on Python codeHow to architect the blockchain and blockchain applicationsDecentralized application development with MultiChain, NEO, and EthereumOptimizing and enhancing blockchain performance and securityClassical blockchain use cases and how to implement themWho this book is for This book is for anyone who wants to dive into blockchain technology from first principles and build a foundational knowledge of blockchain. Familiarity with Python will be helpful if you want to follow how the blockchain protocols are implemented. For readers who are blockchain application developers, most of the applications used in this book can be executed on any platform.

Blockchain for Distributed Systems Security - Sachin Shetty 2019-04-16
AN ESSENTIAL GUIDE TO USING BLOCKCHAIN TO PROVIDE FLEXIBILITY, COST-SAVINGS, AND SECURITY TO DATA MANAGEMENT, DATA ANALYSIS, AND INFORMATION SHARING Blockchain for Distributed Systems Security contains a description of the properties that underpin the formal foundations of Blockchain technologies and explores the practical issues for deployment in cloud and Internet of Things (IoT) platforms. The authors—noted experts in the field—present security and privacy issues that must be addressed for Blockchain technologies to be adopted for civilian and military domains. The book covers a range of topics including data provenance in cloud storage, secure IoT models, auditing architecture, and empirical validation of permissioned Blockchain platforms. The book's security and privacy analysis helps with an understanding of the basics of Blockchain and it explores the quantifying impact of the new attack surfaces introduced by Blockchain technologies and platforms. In addition, the book contains relevant and current updates on the topic. This important resource: Provides an overview of Blockchain-based secure data management and storage for cloud and IoT Covers cutting-edge research findings on topics including invariant-based supply chain protection, information sharing framework, and trust worthy information federation Addresses security and privacy concerns in Blockchain in key areas, such as preventing digital currency miners from launching attacks against mining pools, empirical analysis of the attack surface of Blockchain, and more Written for researchers and experts in computer science and engineering, Blockchain for Distributed Systems Security contains the most recent information and academic research to provide an understanding of the application of Blockchain technology.

Blockchain Applications in IoT Security - Patel, Harshita 2020-09-18
Like many other scientific innovations, scientists are looking to protect the internet of things (IoT) from unfortunate losses, theft, or misuse. As one of the current hot trends in the digital world, blockchain technology could be the solution for securing the IoT. Blockchain Applications in IoT Security presents research for understanding IoT-generated data security issues, existing security facilities and their limitations and future possibilities, and the role of blockchain technology. Featuring coverage on a broad range of topics such as cryptocurrency, remote monitoring, and smart computing, this book is ideally designed for security analysts, IT specialists, entrepreneurs, business professionals, academicians, researchers, students, and industry professionals seeking current studies on the limitations and possibilities behind competitive blockchain technologies.

Blockchain Applications in the Smart Era - Sanjay Misra 2022
This book covers a variety of topics and trends related to blockchain technology for smart era applications. The applications span industries such as transportation, manufacturing, agriculture, finance, retail, logistics, information systems, all far beyond blockchain's original use in cyptocurrency. The authors present variants, new models, practical solutions, and technological advances related to blockchain in these fields and more. The applications within these fields include blockchain and cyber-security, IoT security and privacy using blockchain, security using blockchain for robots, and blockchain in industries 4.0 and society 5.0. A variety of case studies are also included. The book is applicable to researchers, professionals, students, and professors in a variety of fields in communications engineering. Presents challenges and trends in blockchain for applications in manufacturing, health, security, and government finance; Discusses the impact of blockchain on society and industry; Applicable to researchers, professionals, students, and professors in a variety of fields in communications engineering.

Schneier on Security - Bruce Schneier 2009-03-16
Presenting invaluable advice from the world?s most famous computer security expert, this intensely readable collection features some of the most insightful and informative coverage of the strengths and weaknesses of computer security and the price people pay -- figuratively and literally -- when security fails. Discussing the issues surrounding things such as airplanes, passports, voting machines, ID cards, cameras, passwords, Internet banking, sporting events, computers, and castles, this book is a must-read for anyone who values security at any level -- business, technical, or personal.

Blockchain Technology and Applications - Pethuru Raj 2020-09-16
Blockchain is emerging as a powerful technology, which has attracted the wider attention of all businesses across the globe. In addition to financial businesses, IT companies and business organizations are keenly analyzing and adapting this technology for improving business processes. Security is the primary enterprise application. There are other crucial applications that include creating decentralized applications and smart contracts, which are being touted as the key differentiator of this pioneering technology. The power of any technology lies in its ecosystem. Product and tool vendors are building and releasing a variety of versatile and robust toolsets and platforms in order to speed up and simplify blockchain application development, deployment and management. There are other infrastructure-related advancements in order to streamline blockchain adoption. Cloud computing, big data analytics, machine and deep learning algorithm, and connected and embedded devices all are driving blockchain application development and deployment. Blockchain Technology and Applications illustrates how blockchain is being sustained through a host of platforms, programming languages, and enabling tools. It examines: Data confidential, integrity, and authentication Distributed consensus protocols and algorithms Blockchain systems design criteria and systems interoperability and scalability Integration with other technologies including cloud and big data It also details how blockchain is being blended with cloud computing, big data analytics and IoT across all industry verticals. The book gives readers insight into how this path-breaking technology can be a value addition in several business domains ranging from healthcare, financial services, government, supply chain and retail.

Blockchain Technology for Emerging Applications - SK Hafizul Islam 2022-05-21
Blockchain Technology for Emerging Applications: A Comprehensive Approach explores recent theories and applications of the execution of blockchain technology. Chapters look at a wide range of application areas, including healthcare, digital physical frameworks, web of-things, smart transportation frameworks, interruption identification frameworks, ballot-casting, architecture, smart urban communities, and digital rights administration. The book addresses the engineering, plan objectives, difficulties, constraints, and potential answers for blockchain-based frameworks. It also looks at blockchain-based design perspectives of

these intelligent architectures for evaluating and interpreting real-world trends. Chapters expand on different models which have shown considerable success in dealing with an extensive range of applications, including their ability to extract complex hidden features and learn efficient representation in unsupervised environments for blockchain security pattern analysis. Introduces the basic architecture and taxonomy of blockchain technology Surveys the most recent developments and challenges in blockchain-enabled technology for various application domains with fundamental and technical depth Investigates how to devise secure and reliable applications and blockchain-enabled decentralized secure solutions using blockchain technology

Crypto Basics - Slava Gomzin 2022-09-27
Use this practical, step-by-step guide for developers and entrepreneurs to create and run your own cryptocurrency. Author Slava Gomzin has created two cryptocurrencies and describes in this book the technology and economics of cryptocurrencies as preparation for crypto trading, investing, and other business activities. A detailed overview of special topics includes security, privacy, and usability of crypto as a mainstream payment system. Part I, Understanding Crypto, explains the technology and economic, security, and usability aspects of crypto. This is an introduction to the world of cryptography, blockchain tech, and other elements of crypto such as security, privacy, and a detailed review of payment processing. Part II, Using Crypto, provides the practical knowledge you need to dive into the crypto business such as investment, trading, and even creating your own crypto project. Part III, Creating Your Own Crypto, teaches you how to launch your own crypto project and create your own cryptocurrency. What You Will Learn Know how cryptography, Bitcoin, and other cryptos work Understand how crypto becomes money, and how crypto exchanges work Use crypto as a payment method Buy your first crypto and know what exchange you should use Be aware of the most dangerous crypto attacks and what to do about security and privacy Maintain anonymity and privacy while dealing with crypto Know how Monero (the most popular privacy-centric cryptocurrency) works Create and run your own crypto project Create your own token, both regular (fungible) and NFT (non-fungible), from selecting the platform to economics and finances Who This Book Is For Crypto inventors, entrepreneurs, developers, investors, and advisors who are thinking about creating their own cryptocurrency; traders and investors, both professional and amateur, looking to enter the crypto markets; and software architects, developers, managers, consultants, executives, and crypto enthusiasts working for merchants, banks, fintech companies, and many other businesses that have started accepting crypto payments or dealing with other aspects of crypto

Blockchain Technology and the Internet of Things - Rashmi Agrawal 2020-12-31
This new volume looks at the electrifying world of blockchain technology and how it has been revolutionizing the Internet of Things and cyber-physical systems. Aimed primarily at business users and developers who are considering blockchain-based projects, the volume provides a comprehensive introduction to the theoretical and practical aspects of blockchain technology. It presents a selection of chapters on topics that cover new information on blockchain and bitcoin security, IoT security threats and attacks, privacy issues, fault-tolerance mechanisms, and more. Some major software packages are discussed, and it also addresses the legal issues currently affecting the field. The information presented here is relevant to current and future problems relating to blockchain technology and will provide the tools to build efficient decentralized applications. Blockchain technology and the IoT can profoundly change how the world—and businesses—work, and this book provides a window into the current world of blockchain. No longer limited to just Bitcoin, blockchain technology has spread into many sectors and into a significant number of different technologies.

Handbook of Blockchain, Digital Finance, and Inclusion - David LEE Kuo Chuen 2017-09-29
Handbook of Digital Finance and Financial Inclusion: Cryptocurrency, FinTech, InsurTech, Regulation, ChinaTech, Mobile Security, and Distributed Ledger explores recent advances in digital banking and cryptocurrency, emphasizing mobile technology and evolving uses of cryptocurrencies as financial assets. Contributors go beyond summaries of standard models to describe new banking business models that will be sustainable and likely to dictate the future of finance. The book not only emphasizes the financial opportunities made possible by digital banking, such as financial inclusion and impact investing, but also looks at engineering theories and developments that encourage innovation. Its ability to illuminate present potential and future possibilities make it a unique contribution to the literature. A companion Volume Two of The Handbook of Digital Banking and Financial Inclusion: ChinaTech, Mobile Security, Distributed Ledger, and Blockchain emphasizes technological developments that introduce the future of finance. Descriptions of recent innovations lay the foundations for explorations of feasible solutions for banks and startups to grow. The combination of studies on blockchain technologies and applications, regional financial inclusion movements, advances in Chinese finance, and security issues delivers a grand perspective on both changing industries and lifestyles. Written for students and practitioners, it helps lead the way to future possibilities. Explains the practical consequences of both technologies and economics to readers who want to learn about subjects related to their specialties Encompasses alternative finance, financial inclusion, impact investing, decentralized consensus ledger and applied cryptography Provides the only advanced methodical summary of these subjects available today

Digital Finance - Baxter Hines 2020-12-03
Explores how the financial industry will be affected by developments in blockchain and cryptocurrencies at the dawn of a new digital age in finance Our financial system is in the midst of a digital revolution. Blockchain, viewed by many experts as "the most important invention since the Internet," has changed the way we exchange value and information. Although most people are aware of Bitcoin and other cryptocurrencies, few understand how security tokens—digitized forms of traditional ownership certificates—can drive blockchain to reach its fullest potential by offering investors features and innovations that are simply not possible with paper certificates. Digital Finance: Security Tokens and Unlocking the Real Potential of Blockchain explains how the integration of blockchain and security token technology will transform the current financial infrastructure and radically improve efficiency, transparency, and security. Using clear language and an easy-to-follow framework, author Baxter Hines draws upon his decades' experience in the financial industry to address how the digitization of assets will drive cost reductions, enhance flexibility, and pave the way for new business models and revenue streams for years to come. Filled with real-world case studies and expert insights on the latest opportunities and trends, such as the COVID-19 pandemic's role in accelerating the adoption of blockchain, this must-have resource: Shows how blockchain and distributed ledger technology are disrupting the financial industry Explains what security tokens are and why they are the next major breakthrough for investing Highlights how blockchain technology has created new and more efficient ways of fund raising and investing Identifies the ways companies like IBM, Fidelity Investments, and AXA are deploying blockchain and tokenized solutions Describes how assets only available to institutional investors could become marketed to the mainstream Discusses the impact that security tokens will have on real assets such as stocks, real estate, bonds, and derivatives Provides insight into how central banks around the world are embracing blockchain and beginning to issue digital currencies Digital Finance: Security Tokens and Unlocking the Real Potential of Blockchain is essential reading for financial professionals, general investors, finance and technology students, regulators, legal professionals, and users of cryptocurrency and blockchain technology.

Blockchain Bubble Or Revolution - Aditya Agashe 2019-06-12
Some experts say that cryptocurrencies and blockchains are just a scam; others say they're "the most important invention since the internet." It's hard to tell who's right. Authored by Product Managers from Google, Microsoft, and Facebook, Bubble or Revolution cuts through the hype to offer a balanced, comprehensive, and accessible analysis of blockchains and cryptocurrencies. You'll learn the core concepts of these technologies and understand their strengths and weaknesses from real-world case studies; dive deep into their technical, economic, political, and legal complexities; and gain insights about their future from exclusive interviews with dozens of tech industry leaders. No coding or math needed! Are cryptocurrencies and blockchains a bubble or a revolution? We'll help you decide for yourself. What's inside: Bitcoin and the blockchain How Bitcoin and blockchains work from a technical perspective with no assumed technical knowledge Satoshi Nakamoto and the history of Bitcoin, the original blockchain A thorough overview of crucial crypto concepts (eg. blocks, keys, mining, nodes, etc.) Frameworks for understanding when it actually makes sense to use blockchain Major application scenarios for blockchain and cryptocurrencies and where it'll fall flat Public blockchains and altcoins Emerging trends in blockchain technology What you should know before buying any cryptocurrency An overview of Etherum and smart contracts

An overview of the strengths and weaknesses of the top altcoins and stable coins, including Monero (XMR), Tether (USDT), and Bitcoin Cash (BCH) Alternatives to blockchain and cryptocurrencies New kinds of decentralized ledger technology (dlt) The economics of both traditional payment methods and cryptocurrencies Cryptocurrency security best practices and major breach case studies Private blockchains How blockchain, cryptocurrencies, and traditional banking and finance will interact with one another in the future Public blockchains vs private blockchains Limitations and shortcomings of public blockchains and cryptocurrencies The role of blockchain in the strategy of top tech companies like Facebook and Microsoft Case studies of how non-tech companies are effectively utilizing blockchain (eg. Walmart using it to prevent foodborne illness) Business blockchain case studies ranging from gaming (e.g. Xbox) to cloud services (e.g. Microsoft Azure's blockchain-as-a-service and Amazon's AWS offering) Blockchain's use for big data, internet of things (IoT), and machine learning (ML) Cryptocurrency regulation and policy ICOs vs STOs vs IPOs ICOs' status as securities The SEC's STO rules and Reg A+/CF/D/S KYC and AML laws The debate over whether cryptocurrencies are securities The official stance of various countries on crypto An overview of crypto policy and regulatory hurdles The role of crypto in emerging markets and China Digital democracy and voting on the blockchain The future of decentralized technology If, how, and when the tokenization of national currencies will play out Facebook and WhatsApp's upcoming cryptocurrencies Currency tokenization and China's efforts to tokenize the yuan Blockchain, IoT, and the tangle Cryptocurrencies vs. fiat vs. the gold standard Predictions about the future of money, business, and currency Why blockchains would do better on Mars than Earth

Investigating Cryptocurrencies - Nick Furneaux 2018-05-10
Investigate crimes involving cryptocurrencies and other blockchain technologies Bitcoin has traditionally been the payment system of choice for a criminal trading on the Dark Web, and now many other blockchain cryptocurrencies are entering the mainstream as traders are accepting them from low-end investors putting their money into the market. Worse still, the blockchain can even be used to hide information and covert messaging, unknown to most investigators. Investigating Cryptocurrencies is the first book to help corporate, law enforcement, and other investigators understand the technical concepts and the techniques for investigating crimes utilizing the blockchain and related digital currencies such as Bitcoin and Ethereum. Understand blockchain and transaction technologies Set up and run cryptocurrency accounts Build information about specific addresses Access raw data on blockchain ledgers Identify users of cryptocurrencies Extracting cryptocurrency data from live and imaged computers Following the money With nearly $150 billion in cryptocurrency circulating and $3 billion changing hands daily, crimes committed with or paid for with digital cash are a serious business. Luckily, Investigating Cryptocurrencies Forensics shows you how to detect it and, more importantly, stop it in its tracks.

Bitcoin and Blockchain - Sandeep Kumar Panda 2020-09-22
In recent years, blockchain development has grown quickly from the original Bitcoin protocol to the second-generation Ethereum platform, and to today's process of building third-generation blockchains. During this evolution, we can see how blockchain technology has evolved from its original form as a distributed database to becoming a fully fledged, globally distributed, cloud computing platform. This book traces the past, present, and future of blockchain technology. Presents the knowledge and history of Bitcoin Offers blockchain applications Discusses developing working code for real-world blockchain applications Includes many real-life examples Covers the original Bitcoin protocol to the second-generation Ethereum platform Bitcoin and Blockchain: History and Current Applications is a useful reference for students, business schools, research scholars, practitioners, and business analytics professionals.

Bitcoin and Cryptocurrency Technologies - Arvind Narayanan 2016-07-19
An authoritative introduction to the exciting new technologies of digital money Bitcoin and Cryptocurrency Technologies provides a comprehensive introduction to the revolutionary yet often misunderstood new technologies of digital currency. Whether you are a student, software developer, tech entrepreneur, or researcher in computer science, this authoritative and self-contained book tells you everything you need to know about the new global money for the Internet age. How do Bitcoin and its block chain actually work? How secure are your bitcoins? How anonymous are their users? Can cryptocurrencies be regulated? These are some of the many questions this book answers. It begins by tracing the history and development of Bitcoin and cryptocurrencies, and then gives the conceptual and practical foundations you need to engineer secure software that interacts with the Bitcoin network as well as to integrate ideas from Bitcoin into your own projects. Topics include decentralization, mining, the politics of Bitcoin, altcoins and the cryptocurrency ecosystem, the future of Bitcoin, and more. An essential introduction to the new technologies of digital currency Covers the history and mechanics of Bitcoin and the block chain, security, decentralization, anonymity, politics and regulation, altcoins, and much more Features an accompanying website that includes instructional videos for each chapter, homework problems, programming assignments, and lecture slides Also suitable for use with the authors' Coursera online course Electronic solutions manual (available only to professors)

Bitcoin and Blockchain Security - Ghassan Karame 2016-09-01