Hardware Security Design Threats And Safeguards

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WOOT '20 - Hardware Security Is Hard: How Hardware Boundaries Define Platform Security Hardwear.io Berlin Online Trainings 2021 | 27th to 30th Jan | Hardware Security *What is a hardware security module* **GOTO 2016 • Secure by Design – the Architect's Guide to Security Design Principles • Eoin Woods IEEE Distinguished Lecture on \"Hardware Security and IP core protection\" by Dr. Anirban Sengupta** Intro to Hardware Security -- Nate Graff Hardware security - Introduction

PASTA Threat Modeling for Cybersecurity | OWASP All Chapters 2020 PresentationGoogle Infrastructure Security Design (Google Cloud Next '17) *Hardware Security - CompTIA Security+ SY0-501 - 3.3 10 IESA - S\u0026D2019 Day2 - Panel Discussion - Hardware Security – Threats \u0026 Solutions* Aviation Cybersecurity: Keeping the Wings On *IoT Security - Network Security is Step One - Think Segmentation* Data Loss Prevention API A Cloud Security Architecture Workshop RFID as Fast As Possible Intro to Asymmetric Key Cryptography *The Next Big Chip Companies (2018)* Cybersecurity for Air Traffic Management (ATM) *Hardware security - Vulnerabilities and Countermeasures in FPGA Systems* FSec 2016 - Jagor Cakmak: Daily operations with Hardware Security Modules Breaking into Embedded Devices and IoT Security - Andrew Costis Tales from Hardware Security Research *HW Security*

Hardware security - Physical Attacks PA Basics*AWS Well-Architected Security: Updated Best Practices and Guidance - AWS Online Tech Talks* Design and Implementation of a Security Architecture for Critical Infrastructure ARM Hardware Security Hardware security - Introduction to Side Channel Attacks Hardware Security Mechanisms for Authentication and Trust Hardware Security Design Threats And

Beginning with an introduction to cryptography, Hardware Security: Design, Threats, and Safeguards explains the underlying mathematical principles needed to design complex cryptographic algorithms. It then presents efficient cryptographic algorithm implementation methods, along with state-of-the-art research and strategies for the design of very large scale integrated (VLSI) circuits and symmetric cryptosystems, complete with examples of Advanced Encryption Standard (AES) ciphers, asymmetric ...

Hardware Security: Design, Threats, and Safeguards ...

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Hardware Security: Design, Threats, and Safeguards 1 ...

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Hardware Security: Design, Threats, and Safeguards - 1st ...

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Hardware Security: Design, Threats, and Safeguards ...

Hardware Security: Design, Threats, And Safeguards Fundamentals of IP and SoC Security: Design, Verification, and Debug eBooks & eLearning Posted by hill0 at Jan. 25, 2017

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Hardware Security Design Threats And Safeguards

1. Introduction to Hardware Security. Part I: Electronic Hardware (ASIC, FPGA, PCBs) 2. Background on Electronic Hardware 3. System-on-Chip (S0C) Design and Test 4. Printed Circuit Boards (PCBs) Design and Test. Part II: HARDWARE ATTACKS: ANALYSIS, EXAMPLES & THREAT MODELS 5. Hardware Trojan Horse 6. Hardware Supply Chain Issues 7.

Hardware Security - 1st Edition

Swarup Bhunia, Mark Tehranipoor, in Hardware Security, 2019. 1.5.1 Attack Vectors. Attack vectors—as they relate to hardware security —are means or paths for bad actors (attackers) to get access to hardware components for malicious purposes, for example, to compromise it or extract secret assets stored in hardware. Example of hardware attack vectors are side-channel attacks, Trojan attacks, IP piracy, and PCB tampering.

Hardware Security - an overview | ScienceDirect Topics

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Hardware Security Design Threats And Safeguards

Meltdown and Spectre were certainly not the first vulnerabilities to result from a hardware design decision, but their widespread impact sparked the interest of the security research community into...

32 hardware and firmware vulnerabilities: A guide to the ...

Hardware backdoors are backdoors in hardware. Conceptionally related, a hardware Trojan (HT) is a malicious modification an electronic system, particularly in the context an integrated circuit. A physical unclonable function (PUF) is a physical entity that is embodied in a physical structure and is easy to evaluate but hard to predict. Further, an individual PUF device must be easy to make but practically impossible to duplicate, even given the exact manufacturing process that produced it.

Hardware security - Wikipedia

Another pressing issue in the world of cyber-security arises from the threats of counterfeit integrated circuits (ICs). Detecting and protecting against these vulnerabilities requires “unclonable” novel hardware security primitives, which can act as fingerprint generators for the manufactured IC instances.

Hardware Security: Design, Threats, and Safeguards ...

Computer security, cybersecurity or information technology security (IT security) is the protection of computer systems and networks from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.. The field is becoming more significant due to the increased reliance on computer systems, the Internet and ...

Computer security - Wikipedia

This course will focus on the importance of addressing different security threats on modern hardware design, manufacturing, installation, and operating practices. In particular, the threats would be shown to be relevant at scales ranging from a single user to an entire nation's public infrastructure. Through theoretical analyses and relevant practical world case studies, the threats would demonstrated, and then state-of-the-art defense techniques would be described.

Hardware Security: CS60004

Engineering Security represents the NYPD’s attempt to organize and circulate these recommendations. Engineering Security is a living document: as new threats and associated protective security design measures evolve, the NYPD will refine and supplement its recommendations. Executive Summary

Engineering Security - New York City

While security threats and violent incidents are on the rise, available funding from state and local governments for security staffing and equipment to protect courts is becoming increasingly limited. ... Funding, Security Equipment, Resources and Partnerships, and Courthouse Design. Hall, ... equipment, vital records and supporting hardware ...

Court Security Resource Guide | NCSC

Hardware security – whether for attack or defense – differs from software, net- work, and data security because of the nature of hardware. Often, hardware design and manufac- turing occur

before or during software develop- ment, and as a result, we must consider hardware security early in product life cycles.

Hardware and Security: Vulnerabilities and

4. Hardware Elements of Security Seymour Bosworth and Stephen Cobb 5. Data Communications and Information Security Raymond Panko 6. Network Topologies, Protocols, and Design Gary C. Kessler and N. Todd Pritsky 7. Encryption Stephen Cobb and Corinne Lefrançois 8. Using a Common Language for Computer Security Incident Information John D. Howard 9.

Beginning with an introduction to cryptography, Hardware Security: Design, Threats, and Safeguards explains the underlying mathematical principles needed to design complex cryptographic algorithms. It then presents efficient cryptographic algorithm implementation methods, along with state-of-the-art research and strategies for the design of very large scale integrated (VLSI) circuits and symmetric cryptosystems, complete with examples of Advanced Encryption Standard (AES) ciphers, asymmetric ciphers, and elliptic curve cryptography (ECC). Gain a Comprehensive Understanding of Hardware Security—from Fundamentals to Practical Applications Since most implementations of standard cryptographic algorithms leak information that can be exploited by adversaries to gather knowledge about secret encryption keys, Hardware Security: Design, Threats, and Safeguards: Details algorithmic- and circuit-level countermeasures for attacks based on power, timing, fault, cache, and scan chain analysis Describes hardware intellectual property piracy and protection techniques at different levels of abstraction based on watermarking Discusses hardware obfuscation and physically unclonable functions (PUFs), as well as Trojan modeling, taxonomy, detection, and prevention Design for Security and Meet Real-Time Requirements If you consider security as critical a metric for integrated circuits (ICs) as power, area, and performance, you'll embrace the design-for-security methodology of Hardware Security: Design, Threats, and Safeguards.

This book provides the foundations for understanding hardware security and trust, which have become major concerns for national security over the past decade. Coverage includes security and trust issues in all types of electronic devices and systems such as ASICs, COTS, FPGAs, microprocessors/DSPs, and embedded systems. This serves as an invaluable reference to the state-of-the-art research that is of critical significance to the security of, and trust in, modern society's microelectronic-supported infrastructures.

This book provides a comprehensive introduction to hardware security, from specification to implementation. Applications discussed include embedded systems ranging from small RFID tags to satellites orbiting the earth. The authors describe a design and synthesis flow, which will transform a given circuit into a secure design incorporating counter-measures against fault attacks. In order to address the conflict between testability and security, the authors describe innovative design-for-testability (DFT) computer-aided design (CAD) tools that support security challenges, engineered for compliance with existing, commercial tools. Secure protocols are discussed, which protect access to necessary test infrastructures and enable the design of secure access controllers.

Frontiers in Hardware Security and Trust provides a comprehensive review of emerging security threats and privacy protection issues, and the versatile state-of-the-art hardware-based security countermeasures and applications proposed by the hardware security

community.

An essential guide to the modeling and design techniques for securing systems that utilize the Internet of Things Modeling and Design of Secure Internet of Things offers a guide to the underlying foundations of modeling secure Internet of Things' (IoT) techniques. The contributors—noted experts on the topic—also include information on practical design issues that are relevant for application in the commercial and military domains. They also present several attack surfaces in IoT and secure solutions that need to be developed to reach their full potential. The book offers material on security analysis to help with in understanding and quantifying the impact of the new attack surfaces introduced by IoT deployments. The authors explore a wide range of themes including: modeling techniques to secure IoT, game theoretic models, cyber deception models, moving target defense models, adversarial machine learning models in military and commercial domains, and empirical validation of IoT platforms. This important book: Presents information on game-theory analysis of cyber deception Includes cutting-edge research finding such as IoT in the battlefield, advanced persistent threats, and intelligent and rapid honeynet generation Contains contributions from an international panel of experts Addresses design issues in developing secure IoT including secure SDN-based network orchestration, networked device identity management, multi-domain battlefield settings, and smart cities Written for researchers and experts in computer science and engineering, Modeling and Design of Secure Internet of Things contains expert contributions to provide the most recent modeling and design techniques for securing systems that utilize Internet of Things.

Hardware Security: A Hands-On Learning Approach provides a broad, comprehensive and practical overview of hardware security that encompasses all levels of the electronic hardware infrastructure. It covers basic concepts like advanced attack techniques and countermeasures that are illustrated through theory, case studies and well-designed, hands-on laboratory exercises for each key concept. The book is ideal as a textbook for upper-level undergraduate students studying computer engineering, computer science, electrical engineering, and biomedical engineering, but is also a handy reference for graduate students, researchers and industry professionals. For academic courses, the book contains a robust suite of teaching ancillaries. Users will be able to access schematic, layout and design files for a printed circuit board for hardware hacking (i.e. the HaHa board) that can be used by instructors to fabricate boards, a suite of videos that demonstrate different hardware vulnerabilities, hardware attacks and countermeasures, and a detailed description and user manual for companion materials. Provides a thorough overview of computer hardware, including the fundamentals of computer systems and the implications of security risks Includes discussion of the liability, safety and privacy implications of hardware and software security and interaction Gives insights on a wide range of security, trust issues and emerging attacks and protection mechanisms in the electronic hardware lifecycle, from design, fabrication, test, and distribution, straight through to supply chain and deployment in the field

This book presents the different challenges of secure processor architecture design for architects working in industry who want to add security features to their designs as well as graduate students interested in research on architecture and hardware security. It educates readers about how the different challenges have been solved in the past and what are the best practices, i.e., the principles, for design of new secure processor architectures. Based on the careful review of past work by many computer architects and security researchers, readers also will come to know the five basic principles needed for secure processor architecture design. The book also presents existing research challenges and potential new research

directions. Finally, it presents numerous design suggestions, as well as discussing pitfalls and fallacies that designers should avoid. With growing interest in computer security and the protection of the code and data which execute on commodity computers, the amount of hardware security features in today's processors has increased significantly over the recent years. No longer of just academic interest, security features inside processors have been embraced by industry as well, with a number of commercial secure processor architectures available today. This book gives readers insights into the principles behind the design of academic and commercial secure processor architectures. Secure processor architecture research is concerned with exploring and designing hardware features inside computer processors, features which can help protect confidentiality and integrity of the code and data executing on the processor. Unlike traditional processor architecture research that focuses on performance, efficiency, and energy as the first-order design objectives, secure processor architecture design has security as the first-order design objective (while still keeping the others as important design aspects that need to be considered).

Machine learning is a potential solution to resolve bottleneck issues in VLSI via optimizing tasks in the design process. This book aims to provide the latest machine-learning–based methods, algorithms, architectures, and frameworks designed for VLSI design. The focus is on digital, analog, and mixed-signal design techniques, device modeling, physical design, hardware implementation, testability, reconfigurable design, synthesis and verification, and related areas. Chapters include case studies as well as novel research ideas in the given field. Overall, the book provides practical implementations of VLSI design, IC design, and hardware realization using machine learning techniques. Features: Provides the details of state-of-the-art machine learning methods used in VLSI design Discusses hardware implementation and device modeling pertaining to machine learning algorithms Explores machine learning for various VLSI architectures and reconfigurable computing Illustrates the latest techniques for device size and feature optimization Highlights the latest case studies and reviews of the methods used for hardware implementation This book is aimed at researchers, professionals, and graduate students in VLSI, machine learning, electrical and electronic engineering, computer engineering, and hardware systems.

Provides the authoritative and up-to-date information required for securing IoT architecture and applications The vast amount of data generated by the Internet of Things (IoT) has made information security vital for not only personal privacy, but also for the sustainability of the IoT itself. Security and Privacy in the Internet of Things brings together high-quality research on IoT information security models, architectures, techniques, and application domains. This concise yet comprehensive volume explores state-of-the-art mitigations in IoT security while addressing important privacy challenges across different IoT layers. Divided into three parts, the book provides timely coverage of IoT architecture, security technologies and mechanisms, and applications. The authors outline emerging trends in IoT security and privacy with a focus on areas such as smart homes and cities, e-health, critical infrastructure, and industrial applications. Topics include authentication and access control, the use of blockchains for IoT transactions, attack detection and prevention, energy-efficient management of IoT objects, and secure integration of IoT and Cloud computing. Presenting the current body of knowledge in a single volume, Security and Privacy in the Internet of Things: Discusses a broad range of IoT architectures and applications Covers both the logical and physical security of IoT devices Examines IoT security and privacy standards, protocols, and approaches Addresses the secure integration of IoT and social networks Describes privacy preserving techniques, intrusion detection systems, and threat and vulnerability analyses Security and Privacy in the Internet of Things: Architectures, Techniques, and Applications is essential reading for

researchers, industry practitioners, and students involved in IoT development and deployment.

With the popularity of hardware security research, several edited monograms have been published, which aim at summarizing the research in a particular field. Typically, each book chapter is a recompilation of one or more research papers, and the focus is on summarizing the state-of-the-art research. Different from the edited monograms, the chapters in this book are not re-compilations of research papers. The book follows a pedagogical approach. Each chapter has been planned to emphasize the fundamental principles behind the logic locking algorithms and relate concepts to each other using a systematization of knowledge approach. Furthermore, the authors of this book have contributed to this field significantly through numerous fundamental papers.