

1. Record Nr.	UNINA9910855397803321
Autore	Joye Marc
Titolo	Advances in Cryptology – EUROCRYPT 2024 : 43rd Annual International Conference on the Theory and Applications of Cryptographic Techniques, Zurich, Switzerland, May 26–30, 2024, Proceedings, Part III // edited by Marc Joye, Gregor Leander
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	9783031587344 3031587340
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (503 pages)
Collana	Lecture Notes in Computer Science, , 1611-3349 ; ; 14653
Altri autori (Persone)	LeanderGregor
Disciplina	5,824
Soggetti	Cryptography Data encryption (Computer science) Data protection Computer networks - Security measures Computer networks Information technology - Management Cryptology Security Services Mobile and Network Security Computer Communication Networks Computer Application in Administrative Data Processing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Organization -- Contents - Part III -- AI and Blockchain -- Polynomial Time Cryptanalytic Extraction of Neural Network Models -- 1 Introduction -- 1.1 Our Contributions -- 1.2 Overview of Our Attack -- 2 Related Work -- 3 Preliminaries -- 3.1 Basic Definitions and Notation -- 3.2 Problem Statement and Assumptions -- 3.3 Carlini et al.'s Differential Attack -- 4 Our New Sign-Recovery Techniques -- 4.1 SOE Sign-Recovery -- 4.2 Neuron Wiggle Sign-Recovery -- 4.3 Last Hidden Layer Sign-Recovery -- 5 Practical Sign Recovery Attacks -- 5.1 Implementation Caveats -- 5.2

Unitary Balanced Neural Networks -- 5.3 CIFAR10 Neural Network -- 6
 Conclusions -- A The Expected Signal-to-Noise Ratio of Neuron Wiggle
 in Unitary Balanced Networks -- B Detailed Results for CIFAR10 --
 References -- Ordering Transactions with Bounded Unfairness:
 Definitions, Complexity and Constructions -- 1 Introduction -- 1.1 Our
 Results -- 2 Preliminaries -- 2.1 Protocol Execution Model -- 2.2
 Transaction Profiles and Dependency Graphs -- 3 Order Fairness -- 3.1
 Bounded Unfairness and Serialization -- 3.2 Transaction Dependency
 Graphs -- 3.3 Bounded Unfairness from Directed Bandwidth -- 3.4
 Fairness versus Liveness -- 3.5 Bounded Unfairness in a Permissionless
 Environment -- 4 Taxis Protocol -- 4.1 TaxisWL Protocol -- 4.2 Taxis
 Protocol -- 5 Discussion and Future Directions -- References --
 Asymptotically Optimal Message Dissemination with Applications to
 Blockchains -- 1 Introduction -- 1.1 Contributions -- 1.2 Technical
 Overview -- 1.3 Related Work -- 2 Model and Preliminaries -- 2.1
 Parties, Adversary and Communication Network -- 2.2 Primitives -- 2.3
 Flooding -- 2.4 Additional Notation -- 3 Per-Party Communication
 Lower Bound -- 4 Warm Up: Optimal Flooding with Constant Diameter
 and Linear Neighbors.
 5 Optimal Flooding with Logarithmic Neighborhood and Diameter --
 5.1 Weak Flooding -- 5.2 Analysis of FFlood -- 5.3 Flooding
 Amplification -- 5.4 Communication Complexity of the Combined
 Protocol -- 6 Flooding in the Weighted Setting -- 7 Security in the UC
 Model -- 7.1 Flooding as a UC Functionality -- 7.2 Strong Flooding
 Implies UC Flooding -- 8 Practicality of EC Flood -- 8.1 Comparison to
 State-of-the-Art -- References -- Proof-of-Work-Based Consensus in
 Expected-Constant Time -- 1 Introduction -- 1.1 Overview of Our
 Results -- 1.2 Related Work -- 2 Model and Preliminaries -- 3 Chain-
 King Consensus -- 3.1 Parallel Chains and m1 Proofs of Work -- 3.2
 From Parallel Chains to Phase Oblivious Agreement -- 3.3 From Phase
 Oblivious Agreement to Chain-King Consensus -- 3.4 Fast Sequential
 Composition -- 4 Application: Fast State Machine Replication -- 4.1
 From Sequential Composition to State Machine Replication -- 4.2
 Bootstrapping from the Genesis Block -- References -- Secure
 and Efficient Implementation, Cryptographic Engineering, and Real-
 World Cryptography -- A Holistic Security Analysis of Monero
 Transactions -- 1 Introduction -- 1.1 Our Approach: A Modular
 Analysis of RingCT -- 1.2 Technical Highlights and Findings -- 1.3
 Related Work -- 2 Informal Overview of Monero Transactions -- 3
 Model for Private Transaction Schemes -- 3.1 Syntax -- 3.2 Security --
 4 Overview of Our Analysis -- 4.1 Security Notions for Components --
 4.2 System Level Analysis -- 4.3 Component Level Analysis -- 5 Other
 Models for RingCT-Like Systems -- 6 Limitations and Future Work --
 References -- Algorithms for Matrix Code and Alternating Trilinear
 Form Equivalences via New Isomorphism Invariants -- 1 Introduction --
 1.1 Previous Works -- 1.2 Our Contributions -- 2 Preliminaries -- 3
 Finding Equivalences of Trilinear Forms via Invariants.
 4 An Algorithm for Matrix Code Equivalence -- 4.1 The Main Idea --
 4.2 From a Vector to Three Vector Tuples -- 4.3 Corank-1 Invariants
 from Three Vector Tuples -- 4.4 Description of the Algorithm -- 4.5
 Heuristic Assumptions for the Invariant -- 4.6 Experimental Results for
 the Algorithm -- 5 An Algorithm for Alternating Trilinear Form
 Equivalence -- 5.1 Beullens' Algorithms for ATFE -- 5.2 An Algorithm
 for ATFE Based on a New Isomorphism Invariant -- 5.3 The
 Isomorphism Invariant Step -- 5.4 Concrete Estimations of This
 Algorithm for ALTEQ Parameters -- 6 Quantum Attacks -- 6.1 Collision
 Detection Through Quantum Random Walks -- 6.2 Solving ATFE
 Through Quantum Random Walks -- 6.3 Low-Rank Birthday Attacks on

ATFE via Quantum Random Walks -- 6.4 Low-Rank Birthday Attacks on MCE via Quantum Random Walks -- A Low-Rank Point Sampling via Min-Rank Step -- References -- Generalized Feistel Ciphers for Efficient Prime Field Masking -- 1 Introduction -- 2 Feistel for Prime Masking -- 2.1 High-Level Structure -- 2.2 Rounds R of FPM via Type-II Generalized Feistel -- 2.3 Function F of the Type-III Generalized Feistel -- 2.4 Summary of the FPM Design Space -- 3 High-level Rationale and Security Arguments -- 3.1 TWEAKEY Framework and LED-Like Design -- 3.2 Rationale Behind the Generalized Type-II Feistel Scheme -- 3.3 Rationale and Construction of the Function F -- 4 small-pSquare: a Hardware-oriented Instance -- 5 Mathematical Security Analysis of small-pSquare -- 5.1 Differential Cryptanalysis -- 5.2 Degree and Density of the Polynomial Representation -- 5.3 Linearization Attack -- 6 Hardware Performance Evaluation of small-pSquare -- 7 Side-Channel Security Assessment of small-pSquare -- 8 Summary and Open Problems -- References -- A Novel Framework for Explainable Leakage Assessment -- 1 Introduction.

1.1 The Challenge of Interpreting Non-specific Leakage Detection Outcomes -- 1.2 Our Contributions: An Informal Summary -- 2 Preliminaries -- 2.1 Notation -- 2.2 Statistical Hypothesis Testing -- 2.3 Side Channel Observations -- 2.4 Side Channel Attacks (evaluation Context) -- 2.5 Regression Modelling -- 3 Characterising Exploitability and Explainability in the Context of Leakage Detection -- 3.1 Defining Leakage -- 3.2 Defining Exploitable Key Leakage -- 3.3 Defining Explainable Key-Leakage Detection -- 4 Detecting Key-Dependency via Non-specific Models -- 4.1 Detecting Key Leakage -- 4.2 Concrete Parameter Selection in an Evaluation Setting -- 5 A Novel Leakage Assessment Framework -- 5.1 Detecting Exploitable Leakage -- 5.2 An Explainable Detection Method -- 5.3 A Framework for Detection -- 6 Application: A Masked 32-Bit ASCON Implementation -- 6.1 Leakage Detection, and Why to Dig Deep -- 6.2 Assessing Key Leakage: Degree Analyses -- 6.3 Fine-Grained Analysis -- 6.4 Constructing a Concrete Attack Vector -- 7 Application: An Affine Masked 32-Bit AES Implementation -- 7.1 Assessing Key Leakage Due to Parallelism -- 7.2 Assessing Key Leakage Due to Sequential Processing -- 8 Discussion -- 8.1 Applications to Other Types of Implementations -- 8.2 Importance of Explainability in Leakage Assessment -- 8.3 Complexity of Our Approach -- 8.4 Extension to Other Model Building Methods and Inherently Multivariate Methods -- 8.5 Optimal vs. Confirmatory Attack Vectors -- References -- Integrating Causality in Messaging Channels -- 1 Introduction -- 1.1 Causality in Cryptographic Channels -- 1.2 Our Contributions -- 1.3 Further Related Work -- 2 Causality Graphs -- 3 Preliminaries -- 4 Bidirectional Channels and Causality Preservation -- 4.1 Bidirectional Channels -- 4.2 Local Graph and Its Update Function -- 4.3 Causality Preservation.

4.4 Causality Preservation with Post-compromise Security -- 4.5 Relations to Integrity Notions -- 5 Causality Preservation of Signal -- 5.1 The Signal Channel and Its Insecurity -- 5.2 Integrating Causality in Signal -- 6 Message Franking Channels and Causality Preservation -- 6.1 Message Franking Channels -- 6.2 Causality Preservation of Message Franking Channels -- 7 Causality Preservation of Facebook's Message Franking -- 7.1 Facebook's Message Franking Channel and Its Insecurity -- 7.2 Integrating Causality in Facebook's Message Franking -- 8 Conclusion -- References -- Symmetric Signcryption and E2EE Group Messaging in Keybase -- 1 Introduction -- 2 Preliminaries -- 2.1 Standard Security Notions in a Multi-key Setting -- 3 Symmetric Signcryption -- 3.1 In-Group Unforgeability -- 3.2 Out-Group Authenticated Encryption -- 3.3 Symmetric Signcryption from

Encryption and Signatures -- 4 Keybase Chat Encryption as Symmetric Signcryption -- 5 Security Analysis of Keybase Chat Encryption -- 5.1 In-Group Unforgeability of BoxMessage and SealPacket -- 5.2 Out-Group AE Security of BoxMessage -- 5.3 Out-Group AE Security of SealPacket -- 6 Conclusions -- References -- Theoretical Foundations (I/II) -- Trapdoor Memory-Hard Functions -- 1 Introduction -- 1.1 Memory-Hard Functions -- 1.2 Trapdoor MHFs -- 1.3 The Diodon TMHF -- 1.4 Contributions and Technical Overview -- 1.5 Open Problems -- 2 Preliminaries -- 2.1 Notation -- 2.2 Algebraic Setting -- 2.3 Generic Group Model -- 2.4 Machine Model and Complexity Measure -- 3 A Trapdoor Memory-Hard Function from Factoring -- 3.1 Trapdoor Memory-Hard Functions -- 3.2 Description of TDScript -- 4 Overview of the Lower Bound Proof -- 5 Single-Challenge Time-Memory Trade-Off -- 5.1 Reasoning About A_1 's Queries Algebraically -- 5.2 Proof Skeleton -- 5.3 Analyzing the Behavior of $Ax = b$. 5.4 Combinatorial Proof of the $\text{rank}(A)$ Lower Bound.

Sommario/riassunto

The 7-volume set LNCS 14651 - 14657 conference volume constitutes the proceedings of the 43rd Annual International Conference on the Theory and Applications of Cryptographic Techniques, EUROCRYPT 2024, held in Zurich, Switzerland, in May 2024. The 105 papers included in these proceedings were carefully reviewed and selected from 500 submissions. They were organized in topical sections as follows: Part I: Awarded papers; symmetric cryptology; public key primitives with advanced functionalities; Part II: Public key primitives with advances functionalities; Part III: AI and blockchain; secure and efficient implementation, cryptographic engineering, and real-world cryptography; theoretical foundations; Part IV: Theoretical foundations; Part V: Multi-party computation and zero-knowledge; Part VI: Multi-party computation and zero-knowledge; classic public key cryptography, Part VII: Classic public key cryptography.
