

1. Record Nr.	UNISA996594167603316
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 I
Pubbl/distr/stampa	Cham : , : Springer International Publishing AG, , 2024 ©2024
ISBN	3-031-58716-2
Edizione	[1st ed.]
Descrizione fisica	1 online resource (505 pages)
Collana	Lecture Notes in Computer Science Series ; ; v.14651
Altri autori (Persone)	LeanderGregor
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Organization -- Contents - Part I -- Awarded Papers -- SQIsignHD: New Dimensions in Cryptography -- 1 Introduction -- 1.1 A Modular Overview of SQIsignHD -- 2 Representing the Response Isogeny Efficiently in Higher Dimension -- 2.1 State of the Art Isogeny Representation: A Slow Signature Process -- 2.2 Embedding Isogenies in Higher Dimension with Kani's Lemma -- 2.3 Application of Kani's Lemma to SQIsign -- 3 Key Generation, Commitment and Challenge -- 3.1 Accessible Torsion and Choice of the Prime Characteristic -- 3.2 Challenge Generation -- 3.3 Fast Key Generation and Commitment -- 4 Response and Verification -- 4.1 Overview of the Response Computation -- 4.2 Finding a Uniformly Random Tight Response Ideal -- 4.3 Dividing the Higher Dimensional Isogeny Computation in Two -- 4.4 Computing the Response Isogeny Representation -- 4.5 Verification -- 5 Security Analysis -- 5.1 Knowledge Soundness -- 5.2 Heuristic Zero-Knowledge Property -- 5.3 On Hardness of the Supersingular Endomorphism Problem with Access to an Auxiliary Oracle -- 6 The SQIsignHD Digital Signature Scheme -- 6.1 Compactness -- 6.2 Time Efficiency -- References -- Tight Indistinguishability Bounds for the XOR of Independent Random Permutations by Fourier Analysis -- 1 Introduction -- 1.1 The XoP Construction -- 1.2 Our Contribution -- 1.3 Paper Structure -- 2 Preliminaries -- 2.1 Probability -- 2.2 Fourier Analysis -- 2.3

Cryptographic Preliminaries and Sampling Without Replacement -- 3
 Indistinguishability Bounds for $XoP[r,n]$ Using Fourier Properties of
 Sampling Without Replacement -- 3.1 Basic Properties of n,k -- 3.2
 Application to Indistinguishability Bounds for $XoP[r,n]$ -- 4 Bounding
 $M=k[n,k]$ (Proof of Lemma 1) -- 4.1 Bounding $|n,k^{0362n,k()}|$ for
 of Type $K = (k)$ -- 4.2 Classification of Masks -- 4.3 Bounding $|n,k^{0362n,k()}|$
 for General.
 5 Bounding $W=k[n,k]$ (Proof of Lemma 2) -- A Missing Proofs from
 Section4 -- References -- AprèsSQI: Extra Fast Verification for SQIsign
 Using Extension-Field Signing -- 1 Introduction -- 2 Preliminaries --
 2.1 Elliptic Curves and Their Endomorphism Rings -- 2.2 Quaternion
 Algebras and the Deuring Correspondence -- 2.3 SQIsign -- 2.4
 SQIsign-Friendly Primes -- 2.5 Computing Rational Isogenies from
 Irrational Generators -- 3 Signing with Extension Fields -- 3.1 Changes
 in the Signing Procedure -- 3.2 Increased Torsion Availability from
 Extension Fields -- 3.3 Cost of Signing Using Extension Fields -- 4
 Effect of Increased 2-Torsion on Verification -- 4.1 Detailed
 Description of Verification -- 4.2 Impact of Large f on Verification --
 4.3 Implementation and Benchmark of Cost in F_p -Multiplications -- 5
 Optimisations for Verification -- 5.1 Basis Generation for Full 2-Power
 Torsion -- 5.2 General Improvements to Verification -- 5.3 To Push, or
 Not to Push-that is, the Q . -- 5.4 Improved Challenge for f -- 6 Size-
 Speed Trade-Offs in SQIsign Signatures -- 6.1 Adding Seeds for the
 Torsion Basis in the Signature -- 6.2 Uncompressed Signatures -- 7
 Primes and Performance -- 7.1 Performance of Optimised Verification
 -- 7.2 Finding Specific Primes -- 7.3 Performance for Specific Primes
 -- References -- Symmetric Cryptology -- The Exact Multi-user
 Security of (Tweakable) Key Alternating Ciphers with a Single
 Permutation -- 1 Introduction -- 1.1 Research Question -- 1.2
 Contributions -- 1.3 Organization -- 2 Basic Notation -- 3 KACs:
 Specification and Security Definition -- 3.1 KACs with a Single
 Permutation -- 3.2 Definition of μ -SPRP Security of KACs -- 4 μ -
 Security of KACs with a Single Permutation -- 4.1 r -Wise Independent
 Subkeys -- 4.2 μ -SPRP Security Bounds of KACs -- 4.3 Tools for the
 μ -SPRP Security Proof.
 4.4 Re-Sampling Method for Triple Encryption ch4tdesspsccs2022 --
 4.5 Updating the Re-Sampling Method for Arbitrary Round KACs -- 4.6
 Evaluation for Good Transcript -- 5 Proof of Theorem 1 -- 5.1
 Notations and Definitions -- 5.2 Definition of Chain -- 5.3 Dummy
 Internal Values in the Ideal World -- 5.4 Adversary's View -- 5.5 Bad
 Events and Definitions of Good and Bad Transcripts -- 5.6 Deriving the
 Upper-Bound in Theorem 1 -- 5.7 Upper-Bounding $\Pr[TI \text{ Tbad}]$ -- 5.8
 Lower-Bounding $\Pr[TR=] \Pr[TI=]$ -- 5.9 Proof of Lemma 2 -- 5.10 Proof
 of Lemma 3 -- 6 The Exact μ -Security of Tweakable KACs -- 7
 Conclusion -- References -- Partial Sums Meet FFT: Improved Attack
 on 6-Round AES -- 1 Introduction -- 2 Background -- 2.1 Description
 of AES -- 2.2 The Square Attack on AES -- 2.3 The Partial Sums Attack
 -- 2.4 The FFT-Based Attack of Todo and Aoki -- 3 The New
 Technique: Partial Sums Meet FFT -- 3.1 The Basic Technique -- 3.2
 Packing Several FFTs Together by Embedding into Z -- 3.3
 Enhancements and Other Variants of the Basic Technique -- 3.4 Our
 Technique vs. Partial Sums and the Todo-Aoki Technique -- 3.5
 Experimental Verification of Our Attack on 6-Round AES -- 4 Improved
 Attack on Kuznyechik -- 4.1 The Structure of Kuznyechik -- 4.2 The
 Multiset-Algebraic Attack of Biryukov et al. -- 4.3 Improvement Using
 Our Technique -- 5 Summary -- References -- New Records in
 Collision Attacks on SHA-2 -- 1 Introduction -- 2 Preliminaries -- 2.1
 Notations -- 2.2 Description of SHA-2 -- 2.3 Previous Methods to

Search for Differential Characteristics -- 3 SAT/SMT-Based Tools for the MD-SHA Hash Family -- 3.1 SAT/SMT Models for the Signed Difference Transitions -- 3.2 SAT/SMT Models for the Value Transitions -- 3.3 Models for SHA-2 -- 4 New (SFS/FS) Collision Attacks on SHA-2 -- 4.1 The First Practical SFS Collision for 39-Step SHA-256. 4.2 Improved Collision Attacks on 31-Step SHA-256 -- 4.3 The First Collision Attack on 31-Step SHA-512 -- 4.4 The Practical Collision Attack on 28-Step SHA-512 -- 4.5 The First Practical FS Collision for 40-Step SHA-224 -- 5 Summary and Future Work -- References -- Improving Linear Key Recovery Attacks Using Walsh Spectrum Puncturing -- 1 Introduction -- 2 Preliminaries -- 2.1 Binary Vector Spaces -- 2.2 Pseudoboolean Functions and Their Walsh Spectra -- 2.3 Vectorial Boolean Functions -- 2.4 Linear Approximations -- 2.5 Key Recovery Linear Attack Scenario -- 2.6 Distribution of the Experimental Correlation -- 3 Approximating the Key Recovery Map -- 3.1 Effect on the Data Complexity -- 3.2 Walsh Spectrum Puncturing -- 3.3 Experimental Verification -- 3.4 Relationship to Multiple and Multidimensional Attacks -- 4 Puncturing Walsh Spectra -- 4.1 Some Useful Results -- 4.2 Puncturing Strategies -- 5 Application to Serpent -- 5.1 Improved Key Recovery Attack Against 12-Round Serpent-256 -- 5.2 Improved Key Recovery Attack Against 12-Round Serpent-192 -- 6 Application to GIFT-128 -- 6.1 Application to GIFT-128 in the General Setting -- 6.2 Application to GIFT-128 on the COFB Setting -- 7 Application to the Data Encryption Standard -- 8 Application to Noekeon -- 9 Conclusion -- References -- A Generic Algorithm for Efficient Key Recovery in Differential Attacks - and its Associated Tool -- 1 Introduction -- 2 The Key Recovery Problem in Differential Cryptanalysis -- 2.1 Differential Cryptanalysis -- 2.2 Efficient Key Recovery -- 2.3 Considered Ciphers -- 3 Modeling the Key Recovery Problem -- 3.1 Our Modelization -- 3.2 Sieving of the Pairs Using the Differential Constraints of the S-Boxes -- 3.3 Precomputing Partial Solutions -- 3.4 Computing in Parallel -- 4 Algorithm and Its Associated Tool -- 4.1 High-Level Description of Our Algorithm. 4.2 Taking into Account the Techniques of Section 3 -- 4.3 Parameters and Limitations -- 5 Applications -- 5.1 Validity and Experiments -- 5.2 RECTANGLE -- 5.3 PRESENT -- 5.4 GIFT-64 -- 5.5 Application to SPEEDY-7-192 -- 6 Conclusion and Open Problems -- References -- Tight Security of TNT and Beyond -- 1 Introduction -- 1.1 Motivation -- 1.2 Contributions -- 1.3 Impact of Our Birthday-Bound Attack -- 2 Preliminaries -- 2.1 (Tweakable) Block Ciphers and Random Permutations -- 2.2 Security Definition -- 2.3 The Expectation Method -- 3 Birthday-Bound Attack on -- 3.1 Comparing the Number of Collision Pairs in \mathbb{Z}_m and \mathbb{Z}_m^k -- 3.2 The Collision Counting Distinguisher -- 3.3 Experimental Verification -- 4 Spotting the Flaw in the BBB Security Proof of -- 5 Birthday-Bound Security of and Its Variant -- 6 The Generalized LRW Paradigm -- 6.1 Security of LRW+ -- 6.2 Instantiating LRW+ -- 7 Conclusion and Future Directions -- References -- Improved Differential Meet-in-the-Middle Cryptanalysis -- 1 Introduction -- 2 Preliminaries: Differential Meet-in-the-Middle -- 2.1 Framework of the Differential MITM Attack -- 2.2 Improvement: Parallel Partitions for Layers with Partial Subkeys -- 2.3 Reducing Data Needed with Imposed Conditions -- 3 Truncated Differential Meet-in-the-Middle Attack -- 3.1 Framework of the Truncated Differential MITM Attack -- 3.2 Attack Complexities -- 4 New Improvements to Differential MITM Attacks -- 4.1 Improving the Parallel Partitioning -- 4.2 Probabilistic Key Recovery Technique -- 4.3 Applying the State-Test Technique -- 5 MILP Modeling of the Truncated Differential-MITM Attack -- 5.1 MILP Model of the Basic

Attack -- 5.2 MILP Model of the Improved Attack -- 6 Application on
23-Round CRAFT -- 6.1 An Attack on 23 Rounds of CRAFT -- 6.2
Other Attacks on CRAFT and Conclusion -- 7 Applications: SKINNY-64-
192 and SKINNY-128-384.
7.1 Attack on 23-Round SKINNY-64-192.
