Jakub Breier

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Research Interests

- Hardware security – side-channel attacks and fault attacks on ciphers, and countermeasures
- Cryptography – design and analysis of symmetric block ciphers
- Machine learning security – hardware-based attacks on machine learning models, and countermeasures

Experience

Senior Cyber Security Manager July 2023 - Present
TTControl GmbH *Vienna, Austria*

- Evaluating cybersecurity of automotive products during their development lifecycle according to ISO/SAE 21434
- Researching hardware security of automotive electronic control units
- Contributing to research efforts for joint research projects (e.g. Horizon Europe project aerOS[1])

Senior Scientist Embedded Security September 2020 – June 2023
Silicon Austria Labs *Graz, Austria*

- Focused on securing embedded and Edge-based AI models, symmetric cryptography, hardware security
- Led and contributed to various research projects
- Established industrial and academic collaborations, contributing to grant proposals

Cybersecurity Research Lead / Principal Research Fellow May 2019 – September 2020
HP-NTU Digital Manufacturing Corporate Lab *Singapore*

- Led four industrial research projects focused on cybersecurity: Secure machine learning; Evaluation of malware detection techniques; 3D object identification; Visual inspection of printed circuit assembly components
- Led research teams with a maximum capacity of 12 researchers
- Planned and managed the research budget
- Presented results to C-level executives
- Supported cooperation between the university and HP

Senior Cryptography Security Analyst September 2018 – April 2019
Underwriters Laboratories *Singapore*

- Evaluated security of smart cards against physical attacks and certified them in accordance with certification criteria (EMVco, VISA, MasterCard, American Express)
- Evaluated the resistance of cryptographic implementations used in payment schemes – both public key and symmetric key encryption
- Developed novel attacks and protection methods for side-channel analysis and fault analysis
- Contributed to ISO 17025 certification of the laboratory equipment

Research Scientist (Senior from July 2017) November 2013 – September 2018
Nanyang Technological University *Singapore*

- Unit: Physical Analysis and Cryptographic Engineering Laboratory
- Improved state-of-the-art of secure cryptographic implementations with respect to resistance against physical attacks
- Developed software and hardware countermeasures against side-channel and fault attacks

Visiting Researcher April 2014 – July 2014
Fraunhofer AISEC *Munich, Germany*

- Worked in the field of laser fault injection attacks

[1] https://aeros-project.eu

Education

Slovak University of Technology Bratislava, Slovakia
PhD in Applied Informatics *25 October 2013*

- Faculty: Faculty of Informatics and Information Technologies
- Thesis title: Security Evaluation Supported by Information Security Risk Mechanisms
- The thesis developed a novel security evaluation with respect to the ISO/IEC 27002 standard and explored new ways of improving the objectivity and the repeatability of such evaluation.

Masaryk University Brno, Czech Republic
Master in Information Technology Security *29 June 2010*

- Faculty: Faculty of Informatics
- Thesis title: Differential Power Analysis of Rijndael Operations on a Selected Microcontroller
- The main goal of the thesis was to perform the differential power analysis attack in different conditions and on multiple implementations of AES.

Slovak University of Technology Bratislava, Slovakia
Bachelor of Informatics *4 July 2008*

- Faculty: Faculty of Informatics and Information Technologies
- Thesis title: Catalogue of Changes Realized by Aspect-oriented Programming
- This thesis aimed to investigate the possibilities of compilation-level changes that could be done by aspect-oriented programming.

Skills and Certifications

Programming Languages: Java, Python, C/C++, Matlab, Atmel Assembly
Equipment used: Oscilloscopes, Lasers, Pulse Generators, High-Power Amplifiers, Microcontrollers, FPGAs
Certifications: Certified Information Systems Security Professional (CISSP), $(ISC)^2$
Certified Automotive Cybersecurity Professional (CACSP), SGS-TÜV Saar
Oracle Certified Associate (OCA) – Java SE 8 Programmer, Oracle
Languages: Slovak – native, English – fluent, Czech – fluent, German – basic (A2)

Scientific and Societal Impact

- Editorial board member of the IACR Communications in Cryptology since 2023
- Program committee member of the International Conference on VLSI Design & the International Conference on Embedded Systems (VLSID) 2024
- Program committee member of the International Workshop on Fault Diagnosis and Tolerance in Cryptography (FDTC) 2022, 2023
- Program committee member of the Smart Card Research and Advanced Application Conference (CARDIS) 2022, 2023
- Program committee member of the International Workshop on Constructive Side-Channel Analysis and Secure Design (COSADE) 2021, 2022, 2023, 2024
- Member of organization team for the International Workshop on Constructive Side-Channel Analysis and Secure Design (COSADE) 2018
- Program committee member of the International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE) 2021, 2022, 2023
- Program committee member of the International Workshop on Security and Privacy in Intelligent Infrastructures (SP2I) 2023
- Program committee member of the International Symposium on Mobile Internet Security (MobiSec) 2021
- Program committee member of the International Workshop on Security of Mobile Applications (IWSMA) 2017, 2018, 2019, 2020, 2021

Previous and Current Cooperation Partners

I have been collaborating with over 50 researchers from the following institutions:

- Technical University Graz, Austria
- Université catholique de Louvain, Belgium
- Radboud University, Netherlands
- ETH Zurich, Switzerland
- Télécom Paris, France
- Brno University of Technology, Czech Republic
- Slovak University of Technology, Slovakia
- Northwestern University, USA
- University of Alberta, Canada
- Nanyang Technological University, Singapore
- Tsinghua University, China
- University of Hyogo, Japan
- Kyushu University, Japan
- Kobe University, Japan
- Indian Institute of Technology Kharagpur, India
- Indian Institute of Technology Bhilai, India
- Indian Institute of Technology Madras, India
- TCS Research and Innovation, India

Selected Invited Talks

Hardware Security of Cryptography and Deep Learning
Online; Palo Alto, CA, USA 30 August 2022
- Dealer Seminar, Palo Alto Research Center (PARC), Xerox

Cryptography in Payment Systems
Yogyakarta, Indonesia 26 July 2019
- SEAMS-UGM-ITB Summer Course on Coding Theory and Cryptography

Automated Fault Analysis of Block Cipher Implementations
San Francisco, USA 6 March 2019
- RSA Conference 2019

Fault Analysis Automation on Software Targets
Kharagpur, India 3 July 2018
- Targetted Training on Advanced Side Channel Evaluation of Hardware Security

Fault Injection Attacks and Countermeasures
Brno, Czech Republic 28 March 2018
- Brno Security Meetings, FEKT VUT

Fault Attacks on Cryptographic Devices
Vienna, Austria 18 May 2016
- IEEE CS/SMCS Austria Chapter, SBA Research

Security Evaluation Supported by Information Security Mechanisms
Munich, Germany 25 June 2014
- Technical University Munich, EI SEC PhD Seminar

Teaching Experience

Cryptography and Embedded Systems Security (graduate) | *Slovak University of Technology* 2022 - 2023
- Side-channel attacks, fault injection attacks, secure cryptographic implementations, countermeasures

Security of Computer Systems (graduate) | *Slovak University of Technology* 2010 - 2013
- Communication security, security of operating systems, software security, cryptography, security evaluation

Security on Internet (graduate) | *Slovak University of Technology* 2010 - 2013
- Security of Internet protocols, web security, authentication protocols, penetration testing, PKI

Linear Algebra I (undergraduate) | *Slovak University of Technology* 2012 - 2013
- Linear systems, vector spaces, matrix operations

Supervised Theses

Data Mining for Security Purposes | *Master Thesis* 2014
- Student: Martin Uhrin

Anomaly Detection From Log Files Using Data Mining and Visualization | *Master Thesis* 2014
- Student: Jana Branišová

Qualified Electronic Signature via Mobile Phone | *Master Thesis* 2013
- Student: Adam Pomothy

E-learning System for Teaching Network Security | *Bachelor Thesis* 2012
- Student: Michal Petráš

List of Publications

ORCID: https://orcid.org/0000-0002-7844-5267
Google Scholar: https://scholar.google.com/citations?user=LOENK6IAAAAJ&hl=en
citations: 1462; h-index: 22; i10-index: 46 (as of 07 Dec 2023)

Best paper award:ACM CompSysTech 2012 (conference publication [39])

Books

[1] Jakub Breier, Xiaolu Hou, and Shivam Bhasin. *Automated Methods in Cryptographic Fault Analysis*. Springer, 2019. ISBN: 978-3-030-11333-9. DOI: 10.1007/978-3-030-11333-9.

Book chapters

[1] Lejla Batina, Shivam Bhasin, Jakub Breier, Xiaolu Hou, and Dirmanto Jap. "On Implementation-Level Security of Edge-Based Machine Learning Models". In: *Security and Artificial Intelligence*. Springer, 2022, pp. 335–359. ISBN: 978-3-030-98795-4. DOI: 10.1007/978-3-030-98795-4_14.

[2] Jakub Breier, Wei He, and Shivam Bhasin. "Reactive Design Strategies Against Fault Injection Attacks". In: *Fault Tolerant Architectures for Cryptography and Hardware Security*. Ed. by Sikhar Patranabis and Debdeep Mukhopadhyay. Singapore: Springer Singapore, 2018, pp. 213–229. ISBN: 978-981-10-1387-4. DOI: 10.1007/978-981-10-1387-4_11.

[3] Jakub Breier, Dirmanto Jap, and Chien-Ning Chen. "Laser-Based Fault Injection on Microcontrollers". In: *Fault Tolerant Architectures for Cryptography and Hardware Security*. Ed. by Sikhar Patranabis and Debdeep Mukhopadhyay. Singapore: Springer Singapore, 2018, pp. 81–110. ISBN: 978-981-10-1387-4. DOI: 10.1007/978-981-10-1387-4_5.

[4] Sikhar Patranabis, Jakub Breier, Debdeep Mukhopadhyay, and Shivam Bhasin. "Side-Channel Assisted Fault Analysis". In: *Fault Tolerant Architectures for Cryptography and Hardware Security*. Ed. by Sikhar Patranabis and Debdeep Mukhopadhyay. Singapore: Springer Singapore, 2018, pp. 59–77. DOI: 10.1007/978-981-10-1387-4_4.

Articles in peer-reviewed journals

[1] Anubhab Baksi, Shivam Bhasin, Jakub Breier, Dirmanto Jap, and Dhiman Saha. "A Survey on Fault Attacks on Symmetric Key Cryptosystems". In: *ACM Comput. Surv.* 55.4 (2023). ISSN: 0360-0300. DOI: 10.1145/3530054.

[2] Jakub Breier, Xiaolu Hou, Martín Ochoa, and Jesus Solano. "FooBaR: Fault Fooling Backdoor Attack on Neural Network Training". In: *IEEE Transactions on Dependable and Secure Computing* 20.3 (2023), pp. 1895–1908. DOI: 10.1109/TDSC.2022.3166671.

[3] Kyungbae Jang, Anubhab Baksi, Jakub Breier, Hwajeong Seo, and Anupam Chattopadhyay. "Quantum implementation and analysis of default". In: *Cryptography and Communications* (2023), pp. 1–17.

[4] Francesco Berti, Shivam Bhasin, Jakub Breier, Xiaolu Hou, Romain Poussier, François-Xavier Standaert, and Balasz Udvarhelyi. "A Finer-Grain Analysis of the Leakage (Non) Resilience of OCB". In: *IACR Transactions on Cryptographic Hardware and Embedded Systems* (2022), pp. 461–481.

[5] Jakub Breier and Xiaolu Hou. "How Practical Are Fault Injection Attacks, Really?" In: *IEEE Access* 10 (2022), pp. 113122–113130. DOI: 10.1109/ACCESS.2022.3217212.

[6] Jakub Breier, Dirmanto Jap, Xiaolu Hou, Shivam Bhasin, and Yang Liu. "SNIFF: Reverse Engineering of Neural Networks With Fault Attacks". In: *IEEE Transactions on Reliability* 71.4 (2022), pp. 1527–1539. DOI: 10.1109/TR.2021.3105697.

[7] Xiaolu Hou, Jakub Breier, and Shivam Bhasin. "SBCMA: Semi-Blind Combined Middle-Round Attack on Bit-Permutation Ciphers With Application to AEAD Schemes". In: *IEEE Transactions on Information Forensics and Security* 17 (2022), pp. 3677–3690. DOI: 10.1109/TIFS.2022.3213424.

[8] Satyam Kumar, Vishnu Asutosh Dasu, Anubhab Baksi, Santanu Sarkar, Dirmanto Jap, Jakub Breier, and Shivam Bhasin. "Side Channel Attack On Stream Ciphers: A Three-Step Approach To State/Key Recovery". In: *IACR Transactions on Cryptographic Hardware and Embedded Systems* (2022), pp. 166–191.

[9] Xiaolu Hou, Jakub Breier, Dirmanto Jap, Lei Ma, Shivam Bhasin, and Yang Liu. "Physical security of deep learning on edge devices: Comprehensive evaluation of fault injection attack vectors". In: *Microelectronics Reliability* 120 (2021), p. 114116.

[10] Yoo-Seung Won, Xiaolu Hou, Dirmanto Jap, Jakub Breier, and Shivam Bhasin. "Back to the Basics: Seamless Integration of Side-Channel Pre-Processing in Deep Neural Networks". In: *IEEE Transactions on Information Forensics and Security* 16 (2021), pp. 3215–3227.

[11] Manaar Alam, Arnab Bag, Debapriya Basu Roy, Dirmanto Jap, Jakub Breier, Shivam Bhasin, and Debdeep Mukhopadhyay. "Neural Network-based Inherently Fault-tolerant Hardware Cryptographic Primitives without Explicit Redundancy Checks". In: *ACM Journal on Emerging Technologies in Computing Systems (JETC)* 17.1 (2020), pp. 1–30.

[12] Shivam Bhasin, Jakub Breier, Xiaolu Hou, Dirmanto Jap, Romain Poussier, and Siang Meng Sim. "SITM: See-In-The-Middle — Side-Channel Assisted Middle Round Differential Cryptanalysis on SPN Block Ciphers". In: *Transactions on Cryptographic Hardware and Embedded Systems (TCHES)* 3.1 (Nov. 2020), pp. 95–122.

[13] Jakub Breier, Dirmanto Jap, Xiaolu Hou, and Shivam Bhasin. "On Side Channel Vulnerabilities of Bit Permutations in Cryptographic Algorithms". In: *Transactions on Information Forensics and Security (TIFS)* 15 (2020), pp. 1072–1085.

[14] Jakub Breier, Mustafa Khairallah, Xiaolu Hou, and Yang Liu. "A countermeasure against statistical ineffective fault analysis". In: *IEEE Transactions on Circuits and Systems II: Express Briefs* 67.12 (2020), pp. 3322–3326.

[15] Jakub Breier, Xiaolu Hou, and Yang Liu. "On evaluating fault resilient encoding schemes in software". In: *IEEE Transactions on Dependable and Secure Computing* (2019).

[16] Xiaolu Hou, Jakub Breier, Fuyuan Zhang, and Liu Yang. "Fully Automated Differential Fault Analysis on Software Implementations of Block Ciphers". In: *Transactions on Cryptographic Hardware and Embedded Systems (TCHES)* 2.3 (May 2019), pp. 1–29.

[17] Sikhar Patranabis, Nilanjan Datta, Dirmanto Jap, Jakub Breier, Shivam Bhasin, and Debdeep Mukhopadhyay. "SCADFA: Combined SCA+DFA Attacks on Block Ciphers with Practical Validations". In: *Transactions on Computers* 68.10 (Oct. 2019), pp. 1498–1510.

[18] Jakub Breier, Xiaolu Hou, and Liu Yang. "Fault Attacks Made Easy: Differential Fault Analysis Automation on Assembly Code". In: *Transactions on Cryptographic Hardware and Embedded Systems (TCHES)* 1.2 (Apr. 2018), pp. 96–122.

[19] Jakub Breier and Jana Branišová. "A Dynamic Rule Creation Based Anomaly Detection Method for Identifying Security Breaches in Log Records". In: *Wireless Personal Communications* 94.3 (2017), pp. 497–511. ISSN: 1572-834X. DOI: 10.1007/s11277-015-3128-1.

[20] Jakub Breier, Wei He, Shivam Bhasin, Dirmanto Jap, Samuel Chef, Hock Guan Ong, and Chee Lip Gan. "Extensive Laser Fault Injection Profiling of 65 nm FPGA". In: *Journal of Hardware and Systems Security* 1.3 (Sept. 2017), pp. 237–251.

[21] Jakub Breier, Wei He, Dirmanto Jap, Shivam Bhasin, and Anupam Chattopadhyay. "Attacks in Reality: The Limits of Concurrent Error Detection Codes against Laser Fault Injection". In: *Journal of Hardware and Systems Security* 1.4 (Dec. 2017), pp. 298–310.

[22] Jakub Breier, Dirmanto Jap, and Shivam Bhasin. "A Study on Analyzing Side-Channel Resistant Encoding Schemes With Respect to Fault Attacks". In: *Journal of Cryptographic Engineering* 7.4 (Nov. 2017), pp. 311–320. ISSN: 2190-8516. DOI: 10.1007/s13389-017-0166-5.

[23] Jakub Breier. "Asset Valuation Method for Dependent Entities". In: *Journal of Internet Services and Information Security* 4.3 (2014), pp. 72–81. ISSN: 2182-2077.

[24] Jakub Breier and Ladislav Hudec. "Security Mechanisms Role in Information Security Evaluation". In: *Information Technology Applications* 1.2 (2012), pp. 5–15. ISSN: 1338-6468.

[25] Jakub Breier and Marcel Kleja. "On Practical Results of the Differential Power Analysis". In: *Journal of Electrical Engineering* 63.2 (2012), pp. 125–129. ISSN: 1335-3632.

International peer-reviewed conferences/proceedings

[1] Jakub Breier, Dirmanto Jap, Xiaolu Hou, and Shivam Bhasin. "A Desynchronization-Based Countermeasure Against Side-Channel Analysis of Neural Networks". In: *International Symposium on Cyber Security, Cryptology, and Machine Learning*. Springer. 2023, pp. 296–306.

[2] Anubhab Baksi, Arghya Bhattacharjee, Jakub Breier, Takanori Isobe, and Mridul Nandi. "Big Brother is Watching You: A Closer Look at Backdoor Construction (To appear)". In: *Security, Privacy, and Applied Cryptography Engineering: 12th International Conference (SPACE'22)*. Jaipur, India: Springer, Dec. 2022, pp. 1–32.

[3] Anubhab Baksi, Shivam Bhasin, Jakub Breier, Anupam Chattopadhyay, and Vinay BY Kumar. "Feeding Three Birds With One Scone: A Generic Duplication Based Countermeasure To Fault Attacks". In: *2021 Design, Automation & Test in Europe Conference & Exhibition (DATE)*. IEEE. 2021, pp. 561–564.

[4] Anubhab Baksi, Shivam Bhasin, Jakub Breier, Mustafa Khairallah, Thomas Peyrin, Sumanta Sarkar, and Siang Meng Sim. "DEFAULT: Cipher level resistance against differential fault attack". In: *27th Annual International Conference on the Theory and Application of Cryptology and Information Security (Asiacrypt)*. Springer. 2021.

[5] Anubhab Baksi, Jakub Breier, Yi Chen, and Xiaoyang Dong. "Machine learning assisted differential distinguishers for lightweight ciphers". In: *2021 Design, Automation & Test in Europe Conference & Exhibition (DATE)*. IEEE. 2021, pp. 176–181.

[6] Xiaolu Hou, Jakub Breier, and Shivam Bhasin. "DNFA: Differential no-fault analysis of bit permutation based ciphers assisted by side-channel". In: *2021 Design, Automation & Test in Europe Conference & Exhibition (DATE)*. IEEE. 2021, pp. 182–187.

[7] Mustafa Khairallah, Xiaolu Hou, Zakaria Najm, Jakub Breier, Shivam Bhasin, and Thomas Peyrin. "SoK : On DFA Vulnerabilities of Substitution-Permutation Networks". In: *2019 ACM SIGSAC Asia Conference on Computer & Communications Security (AsiaCCS)*. Auckland, New Zealand: ACM, 2019, pp. 403–414.

[8] Anubhab Baksi, Shivam Bhasin, Jakub Breier, Mustafa Khairallah, and Thomas Peyrin. "Protecting Block Ciphers against Differential Fault Attacks without Re-keying". In: *2018 IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*. Washington DC, USA, Apr. 2018, pp. 191–194.

[9] Jakub Breier, Xiaolu Hou, Dirmanto Jap, Lei Ma, Shivam Bhasin, and Yang Liu. "Practical Fault Attack on Deep Neural Networks". In: *2018 ACM SIGSAC Conference on Computer & Communications Security (CCS)*. Toronto, Canada: ACM, Oct. 2018, pp. 2204–2206.

[10] Jakub Breier, Dirmanto Jap, and Shivam Bhasin. "SCADPA: Side-Channel Assisted Differential-Plaintext Attack on Bit Permutation Based Ciphers". In: *2018 Design, Automation and Test in Europe (DATE)*. Dresden, Germany: IEEE, Mar. 2018, pp. 1129–1134.

[11] Samuel Chef, Chung Tah Chua, Jing Yun Tay, Yu Wen Siah, Shivam Bhasin, Jakub Breier, and Chee Lip Gan. "Descrambling of Embedded SRAM Using a Laser Probe". In: *2018 IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA)*. Singapore: IEEE, June 2018, pp. 1–6.

[12] Mustafa Khairallah, Rajat Sadhukhan, Radhamanjari Samanta, Jakub Breier, Shivam Bhasin, Rajat Subhra Chakraborty, Anupam Chattopadhyay, and Debdeep Mukhopadhyay. "DFARPA: Differential Fault Attack Resistant Physical Design Automation". In: *2018 Design, Automation and Test in Europe (DATE)*. Dresden, Germany: IEEE, Mar. 2018, pp. 1171–1174.

[13] Prasanna Ravi, Shivam Bhasin, Jakub Breier, and Anupam Chattopadhyay. "PPAP and iPPAP: PLL-based Protection Against Physical Attacks". In: *2018 IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*. Hong Kong SAR, China: IEEE, June 2018, pp. 620–625.

[14] Sayandeep Saha, Dirmanto Jap, Jakub Breier, Shivam Bhasin, Debdeep Mukhopadhyay, and Pallab Dasgupta. "Breaking Redundancy-Based Countermeasures with Random Faults and Power Side Channel". In: *2018 Workshop on Fault Diagnosis and Tolerance in Cryptography (FDTC)*. Amsterdam, Netherlands: IEEE, Sept. 2018, pp. 1–8.

[15] Jakub Breier, Wei He, and Shivam Bhasin. "An Electromagnetic Fault Injection Sensor using Hogge Phase-Detector". In: *Proceedings of the 18th International Symposium on Quality Electronic Design (ISQED 2017)*. Santa Clara, CA, USA: IEEE, Mar. 2017, pp. 307–312.

[16] Jakub Breier and Xiaolu Hou. "Feeding Two Cats with One Bowl: On Designing a Fault and Side-Channel Resistant Software Encoding Scheme". In: *Topics in Cryptology – CT-RSA 2017: The Cryptographers' Track at the RSA Conference 2017, San Francisco, CA, USA, February 14–17, 2017, Proceedings*. Ed. by Helena Handschuh. Cham: Springer International Publishing, Feb. 2017, pp. 77–94. ISBN: 978-3-319-52153-4. DOI: 10.1007/978-3-319-52153-4_5.

[17] Wei He, Jakub Breier, and Shivam Bhasin. "An FPGA-Compatible PLL-Based Sensor Against Fault Injection Attack". In: *Proceedings of the 22nd Asia and South Pacific Design Automation Conference (ASP-DAC 2017)*. Tokio, Japan, Jan. 2017, pp. 1–2.

[18] S V Dilip Kumar, Sikhar Patranabis, Jakub Breier, Debdeep Mukhopadhyay, Shivam Bhasin, Anupam Chattopadhyay, and Anubhab Baksi. "A Practical Fault Attack on ARX-like Ciphers with a Case Study on ChaCha20". In: *2017 Workshop on Fault Diagnosis and Tolerance in Cryptography (FDTC)*. Taipei, Taiwan: IEEE, Dec. 2017, pp. 1–8.

[19] Sikhar Patranabis, Debdeep Mukhopadhyay, Jakub Breier, and Shivam Bhasin. "One Plus One is More than Two: A Practical Combination of Power and Fault Analysis Attacks on PRESENT and PRESENT-like Block Ciphers". In: *2017 Workshop on Fault Diagnosis and Tolerance in Cryptography (FDTC)*. Taipei, Taiwan: IEEE, Dec. 2017, pp. 1–8.

[20] Jakub Breier. "On Analyzing Program Behavior under Fault Injection Attacks". In: *2016 11th International Conference on Availability, Reliability and Security (ARES)*. Aug. 2016, pp. 474–479. DOI: 10.1109/ARES.2016.4.

[21] Jakub Breier and Chien-Ning Chen. "On Determining Optimal Parameters for Testing Devices Against Laser Fault Attacks". In: *Proceedings of The 15th International Symposium on Integrated Circuits (ISIC)*. Singapore: IEEE, Dec. 2016, pp. 1–4.

[22] Jakub Breier, Dirmanto Jap, and Shivam Bhasin. "The Other Side of The Coin: Analyzing Software Encoding Schemes Against Fault Injection Attacks". In: *2016 IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*. McLean, VA, USA, May 2016, pp. 209–216. DOI: 10.1109/HST.2016.7495584.

[23] Wei He, Jakub Breier, and Shivam Bhasin. "Cheap and Cheerful: A Low-Cost Digital Sensor for Detecting Laser Fault Injection Attacks". In: *Security, Privacy, and Applied Cryptography Engineering: 6th International Conference, SPACE 2016, Hyderabad, India, December 14-18, 2016, Proceedings*. Ed. by Claude Carlet, M. Anwar Hasan, and Vishal Saraswat. Cham: Springer International Publishing, Dec. 2016, pp. 27–46. ISBN: 978-3-319-49445-6. DOI: 10.1007/978-3-319-49445-6_2.

[24] Wei He, Jakub Breier, Shivam Bhasin, and Anupam Chattopadhyay. "Bypassing Parity Protected Cryptography Using Laser Fault Injection in Cyber-Physical System". In: *Proceedings of the 2nd ACM International Workshop on Cyber-Physical System Security*. CPSS '16. Xi'an, China: ACM, May 2016, pp. 15–21. ISBN: 978-1-4503-4288-9. DOI: 10.1145/2899015.2899019.

[25] Wei He, Jakub Breier, Shivam Bhasin, Dirmanto Jap, Hock Guan Ong, and Chee Lip Gan. "Comprehensive Laser Sensitivity Profiling and Data Register Bit-Flips for Cryptographic Fault Attacks in 65 Nm FPGA". In: *Security, Privacy, and Applied Cryptography Engineering: 6th International Conference, SPACE 2016, Hyderabad, India, December 14-18, 2016, Proceedings*. Ed. by Claude Carlet, M. Anwar Hasan, and Vishal Saraswat. Cham: Springer International Publishing, Dec. 2016, pp. 47–65. ISBN: 978-3-319-49445-6. DOI: 10.1007/978-3-319-49445-6_3.

[26] Wei He, Jakub Breier, Shivam Bhasin, Noriyuki Miura, and Makoto Nagata. "Ring Oscillator under Laser: Potential of PLL-based Countermeasure against Laser Fault Injection". In: *2016 Workshop on Fault Diagnosis and Tolerance in Cryptography (FDTC)*. Aug. 2016, pp. 102–113. DOI: 10.1109/FDTC.2016.13.

[27] Jakub Breier and Jana Branišová. "Anomaly Detection from Log Files Using Data Mining Techniques". In: *Information Science and Applications (ICISA), 2015 Sixth International Conference on*. Pattaya, Thailand: Springer, Feb. 2015, pp. 449–457.

[28] Jakub Breier and Wei He. "Multiple Fault Attack on PRESENT with a Hardware Trojan Implementation in FPGA". English. In: *Proceedings of the 2015 Workshop on Secure Internet of Things (SIoT)*. Ed. by Linawati, MadeSudiana Mahendra, ErichJ. Neuhold, AMin Tjoa, and Ilsun You. Conference Publishing Services. Vienna, Austria: IEEE, Sept. 2015, pp. 58–64.

[29] Jakub Breier and Dirmanto Jap. "Testing Feasibility of Back-Side Laser Fault Injection on a Microcontroller". In: *Proceedings of the WESS'15: Workshop on Embedded Systems Security*. WESS'15. Amsterdam, Netherlands: ACM, Sept. 2015, 5:1–5:6. ISBN: 978-1-4503-3667-3. DOI: 10.1145/2818362.2818367.

[30] Jakub Breier, Dirmanto Jap, and Chien-Ning Chen. "Laser Profiling for the Back-Side Fault Attacks (With a Practical Laser Clock Glitch Attack on AES)". In: *First Cyber-Physical System Security Workshop (CPSS 2015)*. Singapore: ACM, Apr. 2015, pp. 99–103.

[31] Dirmanto Jap and Jakub Breier. "Differential Fault Attack on LEA". English. In: *Information and Communication Technology: Third IFIP TC 5/8 International Conference, ICT-EurAsia 2015, and 9th IFIP WG 8.9 Working Conference, CONFENIS 2015, Held as Part of WCC 2015*. Ed. by Linawati, MadeSudiana Mahendra, ErichJ. Neuhold, AMin Tjoa, and Ilsun You. Lecture Notes in Computer Science. Daejeon, Korea: Springer Berlin Heidelberg, Oct. 2015, pp. 265–274.

[32] Jakub Breier and Dirmanto Jap. "A Survey of the State-of-the-Art Fault Attacks". In: *Proceedings of The 14th International Symposium on Integrated Circuits (ISIC)*. Singapore: IEEE, Dec. 2014, pp. 152–155.

[33] Jakub Breier and Adam Pomothy. "Qualified Electronic Signature via SIM Card Using JavaCard 3 Connected Edition Platform". In: *Availability, Reliability and Security (ARES), 2014 Ninth International Conference on*. Fribourg, Switzerland: IEEE, Sept. 2014, pp. 349–355. DOI: 10.1109/ARES.2014.53.

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