

# **11th International Conference on Information Systems Security and Privacy (ICISSP 2025)**

Volume 2

Porto, Portugal  
20-22 February 2025

**Editors:**

**Robert Di Pietro  
Karen Renaud  
Paolo Mori**

ISBN: 979-8-3313-1862-8

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2025) by SCITEPRESS – Science and Technology Publications, Lda.  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact SCITEPRESS – Science and Technology Publications, Lda.  
at the address below.

SCITEPRESS – Science and Technology Publications, Lda.  
Avenida de S. Francisco Xavier, Lote 7 Cv. C,  
2900-616 Setúbal, Portugal

Phone: +351 265 520 185  
Fax: +351 265520 186

[info@scitepress.org](mailto:info@scitepress.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# CONTENTS

---

## INVITED SPEAKERS

### KEYNOTE SPEAKERS

|  |   |
|--|---|
| Rethinking Privacy Protection in Federated Learning in the Face of Model Inversion Attacks<br><i>Wenjing Lou</i>         | 5 |
| Securing Ultra-Large Scale Infrastructures: Challenges and Opportunities<br><i>Awais Rashid</i>                          | 7 |
| Turing's Echo on Deceptive Machines: The Challenge of Distinguishing Human and AI Creations<br><i>Ahmad-Reza Sadeghi</i> | 9 |

## APPLICATIONS AND SERVICES

### FULL PAPERS

|  |     |
|--|-----|
| A Hybrid Approach for Detecting SQL-Injection Using Machine Learning Techniques<br><i>Hari Krishna, Jared Oluoch and Junghwan Kim</i>  | 15  |
| CyLLM-DAP: Cybersecurity Domain-Adaptive Pre-Training Framework of Large Language Models<br><i>Khang Mai, Razvan Beuran and Naoya Inoue</i>  | 24  |
| Assessing the Effectiveness of an LLM-Based Permission Model for Android<br><i>Roberto Milanese, Michele Guerra, Michele Daniele, Giovanni Fabbrocino and Fausto Fasano</i>                            | 36  |
| Scrooge: Detection of Changes in Web Applications to Enhance Security Testing<br><i>Fabio Büsser, Jan Kressebuch, Martín Ochoa, Valentin Zahnd and Ariane Trammell</i>                                 | 48  |
| Privacy Policies in Medium-Sized European Town Administrations: A Comparative Analysis of English and German-Speaking Countries<br><i>Henry Hosseini</i>   | 60  |
| HybridMTD: Enhancing Robustness Against Adversarial Attacks with Ensemble Neural Networks and Moving Target Defense<br><i>Kimia Tahayori, Sherif Saad, Mohammad Mamun and Saeed Samet</i>              | 72  |
| Telosian: Reducing False Positives in Real-Time Cyber Anomaly Detection by Fast Adaptation to Concept Drift<br><i>Iker Antonio Olarra Maldonado, Erik Meeuwissen, Puck de Haan and Rob van der Mei</i> | 84  |
| Large Language Models in Cybersecurity: State-of-the-Art<br><i>Farzad Nourmohammadzadeh Motlagh, Mehrdad Hajizadeh, Mehryar Majd, Pejman Najafi, Feng Cheng and Christoph Meinel</i>                   | 98  |
| SGX-PrivInfer: A Secure Collaborative System for Quantifying and Mitigating Attribute Inference Risks in Social Networks<br><i>Hervais Simo and Michael Kreutzer</i>                                   | 111 |

## SHORT PAPERS

|  |     |
|--|-----|
| The Dual-Edged Sword: The Impact of Large Language Models in Network Infrastructure Security<br><i>David Debono and Anastasia Sare</i>   | 125 |
| Investigating the Effectiveness of Zero-Trust Architecture for Satellite Cybersecurity<br><i>Masrur Masqub Utsash, Georgios Kavallieratos, Konstantinos Antonakopoulos and Sokratis Katsikas</i>                       | 133 |
| Dynamic-Differential Privacy based on Feature Selection with Improved Usability and Security<br><i>Sun-Jin Lee, Hye-Yeon Shim, Jung-Hwa Rye and Il-Gu Lee</i>  | 141 |
| Attackers' Profiling Based on Multi-Attack Patterns in SSH Service<br><i>Kriti Majumdar, Nitesh Kumar, Anand Handa and Sandeep K. Shukla</i>   | 150 |
| Defense Against Backdoor Attacks on Image Retrieval Models Through Strategic Manipulations<br><i>Hung-Lei Lee, Chun-Shien Lu and Jia-Ching Wang</i>  | 160 |
| RiVS: Reputation in VoIP Systems<br><i>Bruno Freitas Cruz and Bruno Sousa</i>  | 167 |
| Cybersecurity Fundamentals Training Among Middle School Students: Building a Strong Foundation<br><i>Qingsong Zhao, Urska Cvek and Kevin Zhao</i>  | 176 |
| Autonomous Cyber Defence by Quantum-Inspired Deep Reinforcement Learning<br><i>Wenbo Feng, Sanyam Vyas and Tingting Li</i>   | 184 |
| Distributed Machine Learning and Multi-Agent Systems for Enhanced Attack Detection and Resilience in IoT Networks<br><i>Gustavo Funchal, Tiago Pedrosa, Fernando de la Prieta and Paulo Leitão</i>                     | 192 |
| LLM-Based Fine-Grained ABAC Policy Generation<br><i>Khang Mai, Nakul Ghate, Jongmin Lee and Razvan Beuran</i>  | 204 |
| The Digital Loophole: Evaluating the Effectiveness of Child Age Verification Methods on Social Media<br><i>Fatmaelzahraa Eltaher, Rahul Krishna Gajula, Luis Miralles-Pechuán, Christina Thorpe and Susan Mckeever</i> | 213 |
| Adaptive Ensemble Defense: Mitigating NLP Adversarial Attacks with Data-Augmented Voting Mechanisms<br><i>Amira Abdelbaky, Sherif Saad and Mohammad Mamun</i>  | 223 |
| Hybrid Classical Quantum Learning Model Framework for Detection of Deepfake Audio<br><i>Atul Pandey and Bhawana Rudra</i>  | 231 |
| Navigating the Security Challenges of LLMs: Positioning Target-Side Defenses and Identifying Research Gaps<br><i>Malte Josten, Matthias Schaffeld, René Lehmann and Torben Weis</i>                                    | 240 |
| Comprehensive Feature Selection for Machine Learning-Based Intrusion Detection in Healthcare IoMT Networks<br><i>Muaan Ur Rehman, Rajesh Kalakoti and Hayretidin Bahşi</i>   | 248 |
| Randomizing Forger Selection to Improve Decentralization in Proof of Stake Consensus Protocol<br><i>Syed Badruddoja, Sasi Kiran Kanduri and Ram Dantu</i>  | 260 |

|   |     |
|---|-----|
| Evaluating and Defending Backdoor Attacks in Image Recognition Systems<br><i>Syed Badruddoja, Bashar Najah Allwza and Ram Dantu</i>   | 268 |
| Exploring Efficiency of Machine Learning in Profiling of Internet of Things Devices for Malicious Activity Detection<br><i>Daniil Legkodymov and Dmitry Levshun</i>   | 276 |
| <b>TECHNOLOGIES AND FOUNDATIONS</b>   |     |
| <b>FULL PAPERS</b>  |     |
| Flow Exporter Impact on Intelligent Intrusion Detection Systems<br><i>Daniela Pinto, João Vitorino, Eva Maia, Ivone Amorim and Isabel Praça</i>   | 289 |
| VBSF: A Visual-Based Spam Filtering Technique for Obfuscated Emails<br><i>Ali Hossary and Stefano Tomasin</i>   | 299 |
| Gram Root Decomposition over the Polynomial Ring: Application to Sphericalization of Discrete Gaussian<br><i>Hiroki Okada and Tsuyoshi Takagi</i>   | 306 |
| Privacy- & Utility-Preserving Data Releases over Fragmented Data Using Individual Differential Privacy<br><i>Luis Del Vasto-Terrientes, Sergio Martínez and David Sánchez</i>   | 318 |
| A Deontic Logic Model of Attribute-Based Information Flows in Database-Defined Networks with Application to Healthcare Monitoring<br><i>Benjamin Aziz, Ukamaka Oragwu and Safa Tharib</i>   | 330 |
| Securing the Device Lifecycle Management: A Scalable and Cost-Efficient Public Key Infrastructure Through Microservices<br><i>Sara Sumaidaa, Hamda Almenhali, Rajkumar Ramasamy, Oleksii Voronin, Mohammed Alazzani and Kyusuk Han</i>  | 342 |
| Exploit the Leak: Understanding Risks in Biometric Matchers<br><i>Dorine Chagnon, Axel Durbet, Paul-Marie Grollemund and Kevin Thiry-Atighehchi</i>   | 353 |
| Enhanced Predictive Clustering of User Profiles: A Model for Classifying Individuals Based on Email Interaction and Behavioral Patterns<br><i>Peter Wafik, Alessio Botta, Luigi Gallo, Gennaro Esposito Mocerino, Cornelia Herbert, Ivan Annicchiarico, Alia El Bolock and Slim Abdennadher</i> | 363 |
| X-Ray Radiation Effects on SRAM-Based TRNG and PUF<br><i>Martin Holec, Jan Bělohoubek, Pavel Rous, Tomáš Pokorný, Róbert Lórencz and František Steiner</i>  | 375 |
| Management of Customized Privacy Policies<br><i>Jens Leicht and Maritta Heisel</i>  | 385 |
| Precise Detection of Security Checks in Program Binaries<br><i>Koyel Pramanick and Prasad A. Kulkarni</i>   | 397 |

## SHORT PAPERS

|   |     |
|---|-----|
| A Secret Key Spreading Protocol for Extending ETSI Quantum Key Distribution<br><i>Thomas Prévost, Bruno Martin and Olivier Alibert</i>  | 411 |
| Quantum-Resilient IoT: Integrating Hardware-Based Post-Quantum Cryptography for Robust Device Security<br><i>Stephan Spitz, Alexander Lawall and Michal Andrzejczak</i>                               | 419 |
| A2CT: Automated Detection of Function and Object-Level Access Control Vulnerabilities in Web Applications<br><i>Michael Schlaubit, Onur Veyisoglu and Marc Rennhard</i>                               | 425 |
| (Deep) Learning About Elliptic Curve Cryptography<br><i>Diana Maimu, Cristian Matei and George Teşeleanu</i>  | 437 |
| Approximations of the Sigmoid Function Beyond the Approximation Domains for Privacy-Preserving Neural Networks<br><i>Shusaku Uemura, Kazuhide Fukushima and Shinsaku Kiyomoto</i>                     | 445 |
| A Targeting Attack by Dynamic Fake QR Code Using Invisible Laser Irradiation<br><i>Dai Itakura, Taiga Manabe, Yuki Kamata, Ayana Oku, Hiroshi Yamamoto, Yoshihisa Takayama and Toshihiro Ohigashi</i> | 455 |
| Logic Locking for Random Forests: Securing HDL Design and FPGA Accelerator Implementation<br><i>Rupesh Raj Karn, Johann Knechtel and Ozgur Sinanoglu</i>  | 463 |
| Is My Data in Your Retrieval Database? Membership Inference Attacks Against Retrieval Augmented Generation<br><i>Maya Anderson, Guy Amit and Abigail Goldstein</i>                                    | 474 |
| Exploring Attack Paths Using Graph Theory: Case - Microsoft Entra ID Pass-Through Authentication<br><i>Nestori Syynimaa</i>   | 486 |
| Objective- and Utility-Based Negotiation for Access Control<br><i>Aditya Sissodiya, Ulf Bodin and Olov Schelén</i>  | 493 |
| Towards Efficient Cloud Data Processing: A Comprehensive Guide to CKKS Parameter Selection<br><i>Modjtaba Gharibyar, Clemens Krüger and Dominik Schoop</i>  | 502 |
| On the Effect of Dataset Size and Composition for Privacy Evaluation<br><i>Danai Georgiou, Carlos Franzreb and Tim Polzehl</i>  | 510 |
| Evaluating the Efficacy of LINDDUN GO for Privacy Threat Modeling for Local Renewable Energy Communities<br><i>Oliver Langthaler, Günther Eibl, Lars-Kevin Klüver and Andreas Unterweger</i>          | 518 |
| Improving Locally Differentially Private Graph Statistics Through Sparseness-Preserving Noise-Graph Addition<br><i>Sudipta Paul, Julián Salas and Vicenç Torra</i>                                    | 526 |
| Secure Visual Data Processing via Federated Learning<br><i>Pedro Santos, Tânia Carvalho, Filipe Magalhães and Luís Antunes</i>  | 534 |
| Leash: A Transparent Capability-Based Sandboxing Supervisor for Unix<br><i>Mahya Soleimani Jadidi and Jonathan Anderson</i>   | 542 |

|  |     |
|--|-----|
| Flexible Noise Based Robustness Certification Against Backdoor Attacks in Graph Neural Networks<br><i>Hiroya Kato, Ryo Meguro, Seira Hidano, Takuo Suganuma and Masahiro Hiji</i>                              | 552 |
| Security Analysis of a Color Image Encryption Scheme Based on a Fractional-Order Hyperchaotic System<br><i>George Teşeleanu</i>  | 564 |
| Security Analysis of Biased Basis for Efficient BB84<br><i>Hiroki Yamamuro, Shohei Beppu, Kazuhide Fukushima and Shinsaku Kiyomoto</i>   | 571 |
| EK-Means: Towards Making Ensemble K-Means Work for Image-Based Data Analysis Without Prior Knowledge of K<br><i>Danping Niu, Yuan Ping, Yujian Liu, Fanxi Wei and Wenhong Wu</i>                               | 575 |
| User Authentication on Remote Connections with Siamese Networks Using Keyboard Usage Behavior and Corresponding Noise Performances<br><i>Mehmet Fide and Emin Anarim</i>                                       | 585 |
| De-Anonymization of Health Data: A Survey of Practical Attacks, Vulnerabilities and Challenges<br><i>Hamza Aguelal and Paolo Palmieri</i>  | 595 |
| Privacy Preservation for Machine Learning in IIoT Data via Manifold Learning and Elementary Row Operations<br><i>E. Fatih Yetkin and Tuğçe Ballı</i>   | 607 |
| Using Compact DNSSEC and Self-Signed Certificate to Improve Security and Privacy for Second-Level Domain Resolution<br><i>Lanlan Pan, Ruonan Qiu and Minghui Yang</i>  | 615 |
| Analytical Evaluation of Time-Based Cryptography<br><i>Mohammed Ramadan, Pranit Gaddekar, Veit Hagenmeyer and Ghada Elbez</i>  | 624 |
| Memory-Saving Oblivious RAM for Trajectory Data via Hierarchical Generation of Dummy Access over Untrusted Cloud Environment<br><i>Taisho Sasada and Bernard Ousmane Sane</i>                                  | 635 |
| Connected Vehicles Data Classification and the Influence of a Sustainable Data Governance for Optimal Utilisation of In-Vehicle Data<br><i>Ali Karimi, Asma Adnane, Iain W. Phillips and Elhadj Benkhelifa</i> | 643 |
| Device-Bound vs. Synced Credentials: A Comparative Evaluation of Passkey Authentication<br><i>Andre Büttner and Nils Gruschka</i>  | 651 |
| AUTHOR INDEX   | 661 |