2023 IEEE Conference on Secure and Trustworthy Machine Learning (SaTML 2023)

Raleigh, North Carolina, USA 8-10 February 2023



IEEE Catalog Number: CFP23BT6-POD **ISBN:**

978-1-6654-6300-3

Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP23BT6-POD
ISBN (Print-On-Demand):	978-1-6654-6300-3
ISBN (Online):	978-1-6654-6299-0

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 E-mail: curran@proceedings.com Web: www.proceedings.com



2023 IEEE Conference on Secure and Trustworthy Machine Learning (SaTML) SaTML 2023

Table of Contents

Message from the Program Committee Co-Chairs	xi
Organizing Committee	xii
Program Committee	xiii
Steering Committee	xv
Keynote Addresses	xvi
Sponsors	xvii

Fairness

Explainable Global Fairness Verification of Tree-Based Classifiers
 Exploiting Fairness to Enhance Sensitive Attributes Reconstruction
 Wealth Dynamics Over Generations: Analysis and Interventions
Learning Fair Representations through Uniformly Distributed Sensitive Attributes

Privacy

Can Stochastic Gradient Langevin Dynamics Provide Differential Privacy for Deep Learning? 6 Guy Heller (University of Bar-Ilan, Ramat Gan, Israel) and Ethan Fetaya (University of Bar-Ilan, Ramat Gan, Israel)	8
 Kernel Normalized Convolutional Networks for Privacy-Preserving Machine Learning	7
Model Inversion Attack with Least Information and an In-Depth Analysis of its Disparate Vulnerability Sayanton V. Dibbo (Dartmouth College), Dae Lim Chung (Dartmouth College), and Shagufta Mehnaz (The Pennsylvania State University)	.9
Distribution Inference Risks: Identifying and Mitigating Sources of Leakage	6
Dissecting Distribution Inference	0

Distributed and Collaborative Learning

ExPLoit: Extracting Private Labels in Split Learning	165
SafeNet: The Unreasonable Effectiveness of Ensembles in Private Collaborative Learning	76
Reprogrammable-FL: Improving Utility-Privacy Tradeoff in Federated Learning via Model Reprogramming	197
Optimal Data Acquisition with Privacy-Aware Agents	210

Integrity at Inference

A Light Recipe to Train Robust Vision Transformers Edoardo Debenedetti (ETH Zurich, Switzerland), Vikash Sehwag (Princeton University, USA), and Prateek Mittal (Princeton University, USA)	225
Less is More: Dimension Reduction Finds On-Manifold Adversarial Examples in Hard-Label Attacks Washington Garcia (University of Florida), Pin-Yu Chen (IBM Research), Hamilton Clouse (Air Force Research Laboratory), Somesh Jha (University of Wisconsin), and Kevin Butler (University of Florida)	.254
Publishing Efficient On-Device Models Increases Adversarial Vulnerability Sanghyun Hong (Oregon State University), Nicholas Carlini (Google Brain), and Alexey Kurakin (Google Brain)	271
EDoG: Adversarial Edge Detection For Graph Neural Networks Xiaojun Xu (University of Illinois at Urbana-Champaign), Hanzhang Wang (eBay), Alok Lal (eBay), Carl Gunter (University of Illinois at Urbana-Champaign), and Bo Li (University of Illinois at Urbana-Champaign)	291
Counterfactual Sentence Generation with Plug-and-Play Perturbation Nishtha Madaan (IBM Research India; Indian Institute of Technology), Diptikalyan Saha (IBM Research India), and Srikanta Bedathur (Indian Institute of Technology)	306
Rethinking the Entropy of Instance in Adversarial Training Minseon Kim (KAIST, South Korea), Jihoon Tack (KAIST, South Korea), Jinwoo Shin (KAIST, South Korea), and Sung Ju Hwang (KAIST, South Korea; AITRICS, South Korea)	316
Towards Transferable Unrestricted Adversarial Examples with Minimum Changes Fangcheng Liu (Peking University), Chao Zhang (Peking University), and Hongyang Zhang (University of Waterloo)	327
"Real Attackers Don't Compute Gradients": Bridging the Gap Between Adversarial ML Research and Practice	339
 What are Effective Labels for Augmented Data? Improving Calibration and Robustness with AutoLabel Yao Qin (Google Research, USA), Xuezhi Wang (Google Research, USA), Balaji Lakshminarayanan (Google Research, USA), Ed H. Chi (Google Research, USA), and Alex Beutel (Google Research, USA) 	365

Integrity at Training Time

 Sniper Backdoor: Single Client Targeted Backdoor Attack in Federated Learning Gorka Abad (Radboud University, The Netherlands; Ikerlan research centre, Spain), Servio Paguada (Radboud University, The Netherlands; Ikerlan research centre, Spain), Oguzhan Ersoy (Radboud University, The Netherlands), The Netherlands), Stjepan Picek (Radboud University, The Netherlands), Víctor Julio Ramírez-Durán (Ikerlan research centre, Spain), and Aitor Urbieta (Ikerlan research centre, Spain) 	377
Backdoor Attacks on Time Series: A Generative Approach Yujing Jiang (University of Melbourne), Xingjun Ma (Fudan University), Sarah Monazam Erfani (University of Melbourne), and James Bailey (University of Melbourne)	392
VENOMAVE: Targeted Poisoning Against Speech Recognition	404

Interpretability and Explainability

Endogenous Macrodynamics in Algorithmic Recourse Patrick Altmeyer (Delft University of Technology, The Netherlands), Giovan Angela (Delft University of Technology, The Netherlands), Aleksander Buszydlik (Delft University of Technology, The Netherlands), Karol Dobiczek (Delft University of Technology, The Netherlands), Arie van Deursen (Delft University of Technology, The Netherlands), and Cynthia C. S. Liem (Delft University of Technology, The Netherlands)	418
ModelPred: A Framework for Predicting Trained Model from Training Data Yingyan Zeng (Virginia Tech, USA), Jiachen T. Wang (Princeton University, USA), Si Chen (Virginia Tech, USA), Hoang Anh Just (Virginia Tech, USA), Ran Jin (Virginia Tech, USA), and Ruoxi Jia (Virginia Tech, USA)	432
 Harnessing Prior Knowledge for Explainable Machine Learning: An Overview	450
Toward Transparent AI: A Survey on Interpreting the Inner Structures of Deep Neural Networks <i>Tilman Rauker (n/a), Anson Ho (Epoch), Stephen Casper (MIT CSAIL), and</i> <i>Dylan Hadfield-Menell (MIT CSAIL)</i>	464

Verification in Machine Learning

Reducing Certified Regression to Certified Classification for General Poisoning Attacks	484
Neural Lower Bounds for Verification Florian Jaeckle (University of Oxford, UK) and M. Pawan Kumar (University of Oxford, UK)	524
 Toward Certified Robustness Against Real-World Distribution Shifts	537
CARE: Certifiably Robust Learning with Reasoning via Variational Inference Jiawei Zhang (University of Illinois Urbana-Champaign, USA), Linyi Li (University of Illinois Urbana-Champaign, USA), Ce Zhang (ETH Zürich, Switzerland), and Bo Li (University of Illinois Urbana-Champaign, USA)	554
 FaShapley: Fast and Approximated Shapley Based Model Pruning Towards Certifiably Robust DNNs Mintong Kang (University of Illinois at Urbana-Champaign), Linyi Li (University of Illinois at Urbana-Champaign), and Bo Li (University of Illinois at Urbana-Champaign) 	575

Model Governance

PolyKervNets: Activation-Free Neural Networks For Efficient Private Inference Toluwani Aremu (Mohamed Bin Zayed Institute of Artificial Intelligence, UAE) and Karthik Nandakumar (Mohamed Bin Zayed Institute of Artificial Intelligence, UAE)	593
Theoretical Limits of Provable Security Against Model Extraction by Efficient Observational Defenses <i>Ari Karchmer (Boston University, USA)</i>	605
No Matter How You Slice It: Machine Unlearning with SISA Comes at the Expense of Minority Classes	622
Data Redaction from Pre-Trained GANs Zhifeng Kong (University of California San Diego, USA) and Kamalika Chaudhuri (University of California San Diego, USA)	638

Responsible AI

Tensions Between the Proxies of Human Values in AI Teresa Datta (Arthur), Daniel Nissani (Arthur), Max Cembalest (Arthur), Akash Khanna (Arthur), Haley Massa (Arthur), and John Dickerson (Arthur)	678
A Validity Perspective on Evaluating the Justified Use of Data-Driven Decision-Making	
Algorithms	690
Amanda Coston (Carnegie Mellon University, USA), Anna Kawakami	
(Carnegie Mellon University, USA), Haiyi Zhu (Carnegie Mellon	
University, USA), Ken Holstein (Carnegie Mellon University, USA), and	
Hoda Heidari (Carnegie Mellon University, USA)	