

Nils Lukas

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Research Interests	Design secure and private Machine Learning systems in the presence of untrustworthy		
	<div>1. Providers: Confidential computing via Homomorphic Encryption & Secret Sharing.</div> <div>2. Data: Mitigate data poisoning during training & prompt injection during inference.</div> <div>3. Models: Protect training data privacy through PII scrubbing & differential privacy.</div> <div>4. Users: Control misuse by detecting generated (mis)information with watermarking.</div>		
Education	University of Waterloo, Canada	2019 - 02/2024	
	Ph.D. in Computer Science		
	<div>▪ Advisor: Florian Kerschbaum</div> <div>▪ Thesis: Analyzing Threats of Large-Scale Machine Learning Systems</div> <div>▪ Thesis Awards: Top Mathematics Doctoral Prize & Alumni Gold Medal</div>		
	RWTH-Aachen, Germany		
	M.Sc. in Computer Science (w/Distinction)	2016 - 2018	
	B.Sc. in Computer Science	10/2012 - 2016	
Honors & Awards	First Place at the NeurIPS'24 Watermarking Competition [4,400 USD]	2024	
	First Place at DGE Elite Hackathon, GITEX'24 [10,900 USD]	2024	
	Top Mathematics Doctoral Thesis, University of Waterloo [1 080 USD]	2024	
	Alumni Gold Medal, One PhD Award Yearly, University of Waterloo	2024	
	Best Poster Award, Sponsored by David R. Cheriton [220 USD]	2023	
	Distinguished Contribution Award, Microsoft MLADS conference	2023	
	David R. Cheriton Scholarship, University of Waterloo [14 400 USD]	2022, 2023	
	Outstanding Reviewer, ICML'22	2022	
	Best Poster Award, Sponsored by Rogers [720 USD]	2019	
Conference Publications	[NeurIPS'25]	Mask Image Watermarking	
	AR: 24.5% (5 290/21 575)	Runyi Hu, Jie Zhang, Shiqian Zhao, Nils Lukas, Jiwei Li, Qing Guo, Han Qiu, Tianwei Zhang. The Thirty-Ninth Annual Conference on Neural Information Processing Systems, 2025.	
	[EMNLP'25]	SPIRIT: Patching Speech Language Models against Jailbreak Attacks	
	AR: 22.2% (1 811/8 172)	Amir Djanibekov, Nurdaulet Mukhituly, Kentaro Inui, Hanan Aldarmaki, Nils Lukas. Empirical Methods in Natural Language Processing (Main Conference), 2025.	
	[ICML'25]	Optimizing Adaptive Attacks against Content Watermarks for Language Models	
	AR: 26.9% (3 260/12 107)		
	🏆 Spotlight (Top 2.6%)	Abdulrahman Diaa, Toluwani Aremu, Nils Lukas. The Forty-Second International Conference on Machine Learning, 2025.	
	[ICML'25]	Cowpox: Towards the Immunity of VLM-based Multi-Agent Systems	
	AR: 26.9% (3 260/12 107)	Yutong Wu, Jie Zhang, Yiming Li, Chao Zhang, Qing Guo, Han Qiu, Nils Lukas, Tianwei Zhang. The Forty-Second International Conference on Machine Learning, 2025.	
	[USENIX'24]	PEPSI: Practically Efficient Private Set Intersection in the Unbalanced Setting	
	AR: 19.1% (417/2 176)	Rasoul Mahdavi, Nils Lukas, Faezeh Ebrahimianghazani, Thomas Humphries, Bailey Kacsmar, John Premkumar, Xinda Li, Simon Oya, Ehsan Amjadian, Florian Kerschbaum. In the 33rd USENIX Security Symposium, 2024.	

Journal Publications	[USENIX'24] AR: 19.1% (417/2176)	Fast and Private Inference of Deep Neural Networks by Co-designing Activation Functions Abdulrahman Diao, Lucas Fenaux, Thomas Humphries, Marian Dietz, Faezeh Ebrahimiaghazani, Bailey Kacsmar, Xinda Li, Nils Lukas , Rasoul Akhavan Mahdavi, Simon Oya, Ehsan Amjadian, Florian Kerschbaum. In the 33rd USENIX Security Symposium, 2024.
	[ICLR'24] AR: 30.8% (2250/7262)	Leveraging Optimization for Adaptive Attacks on Image Watermarks Nils Lukas , Abdulrahman Diao, Lucas Fenaux, Florian Kerschbaum. In the Twelfth International Conference on Learning Representations, 2024.
	[ICLR'24] AR: 30.8% (2250/7262) 🌐 Media Coverage	Universal Backdoor Attacks Benjamin Schneider, Nils Lukas , Florian Kerschbaum. In the Twelfth International Conference on Learning Representations, 2024.
	[USENIX'23] AR: 29.2% (422/1444)	PTW: Pivotal Tuning Watermarking for Pre-Trained Image Generators Nils Lukas and Florian Kerschbaum. In the 32nd USENIX Security Symposium, 2023.
	[S&P'23] AR: 17.0% (195/1147) 🏆 Distinguished Contribution Award at Microsoft MLADS	Analyzing Leakage of Personally Identifiable Information in Language Models Nils Lukas , Ahmed Salem, Robert Sim, Shruti Tople, Lukas Wutschitz, Santiago Zanella-Béguelin. In the 44th IEEE Symposium on Security and Privacy, 2023.
	[S&P'22] AR: 14.5% (147/1012)	SoK: How Robust is Image Classification Deep Neural Network Watermarking? Nils Lukas , Edward Jiang, Xinda Li, Florian Kerschbaum. In the 43rd IEEE Symposium on Security and Privacy, 2022.
	[ICLR'21] AR: 28.7% (860/2997) 🌟 Spotlight (Top 5%)	Deep Neural Network Fingerprinting by Conferrable Adversarial Examples Nils Lukas , Yuxuan Zhang, Florian Kerschbaum. The Ninth International Conference on Learning Representations, 2021.
	[IH&MMSEC'21] AR: 40.3% (128/318)	On the Robustness of Backdoor-based Watermarking in Deep Neural Networks Masoumeh Shafieinejad, Nils Lukas , Jiaqi Wang, Xinda Li, Florian Kerschbaum. Proceedings of the 2021 ACM Workshop on Information Hiding and Multimedia Security, 2021.
	[ACSAC'20] AR: 20.9% (104/497)	Practical Over-Threshold Multi-Party Private Set Intersection Rasoul Mahdavi, Thomas Humphries, Bailey Kacsmar, Simeon Krastnikov, Nils Lukas , John Premkumar, Masoumeh Shafieinejad, Simon Oya, Florian Kerschbaum, Erik-Oliver Blass. Annual Computer Security Applications Conference (ACSAC), 2020.
	[EuroS&P'20] AR: 20.9% (39/187)	Differentially Private Two-Party Set Operations Bailey Kacsmar, Basit Khurram, Nils Lukas , Alexander Norton, Masoumeh Shafieinejad, Zhiwei Shang, Yaser Baseri, Maryam Sepehri, Simon Oya, Florian Kerschbaum. IEEE European Symposium on Security and Privacy (EuroS&P), 2020.
	[AIP'18]	SunFlower: A new Solar Tower Simulation Method for use in Field Layout Optimization , Pascal Richter, Gregor Heiming, Nils Lukas , Martin Frank. AIP Conference Proceedings, Volume 2033, Issue 1, 2018.

Workshop Papers	[GenAI4Health]	Sanitizing Medical Documents with Differential Privacy using Large Language Models Rushil Thareja, Gautam Gupta, Preslav Nakov, Praneeth Vepakomma, Nils Lukas . 2025.
	[WMARK'25]	First-Place Solution to NeurIPS 2024 Invisible Watermark Removal Challenge Fahad Shamshad, Tameem Bakr, Yahia Salaheldin Shaaban, Noor Hazim Hussein, Karthik Nandakumar and Nils Lukas . The 1st Workshop on GenAI Watermarking, 2025.
	[WMARK'25] 🏆 Oral Presentation	Optimizing Adaptive Attacks against Content Watermarks for Language Models Abdulrahman Diao, Toluwani Aremu, Nils Lukas . The 1st Workshop on GenAI Watermarking, 2025.
Working Papers		Differentially Private Inference for Large Language Models , Submitted. Rushil Thareja, Preslav Nakov, Praneeth Vepakomma, Nils Lukas . 2025.
		Mitigating Watermark Forgery in Generative Models via Randomized Key Selection , Submitted. Toluwani Aremu, Noor Hazim Hussein, Munachiso S Nwadike, Samuele Poppi, Jie Zhang, Karthik Nandakumar, Neil Zhenqiang Gong, Nils Lukas . 2025.
		Collaborative Threshold Watermarking , Submitted. Tameem Bakr, Anish Ambreth, Nils Lukas . 2025.
		Robust and Calibrated Detection of Authentic Multimedia Content , Submitted. Sarim Hashmi, Abdelrahman Elsayed, Mohammed Talha Alam, Samuele Poppi, Nils Lukas . 2025.
Research Talks	Adaptively Robust and Forgery-Resistant Watermarking	
	▪ Meta (FAIR), hosted by Hady Elsahar	2025
	Optimizing Adaptive Attacks against Content Watermarks	
	▪ DeepMind, hosted by David Stutz	2024
	▪ University of California, Berkeley, hosted by Dawn Song	2024
	Analyzing Leakage of Personal Information in Language Models	
	▪ Microsoft M365, hosted by Robert Sim	2024
Keynotes	▪ Meta, hosted by Will Bullock	2023
	▪ MongoDB, hosted by Marilyn George and Archita Agarwal	2023
	How Reliable is Watermarking for Image Generators?	
	▪ Google, hosted by Somesh Jha	2023
	▪ University of California, Berkely, hosted by Dawn Song	2023
Work Experience	Aviation Future Week , hosted by Emirates, Dubai	
	Cyber Energy Leadership Forum , Abu Dhabi	
Work Experience	Assistant Professor , MBZUAI, Abu Dhabi, UAE	since 08/2024
	Research Intern , Royal Bank of Canada, Borealis AI, Toronto	2024
	▪ Vertical Federated Learning, hosted by Kevin Wilson	
	Research Intern , Microsoft Research, Cambridge, UK	2022
	▪ Privacy for Language Models, hosted by Shruti Tople & Lukas Wutschitz	
	Research Assistant , RWTH-Aachen, Aachen	2014 - 2018
	Student Researcher , DSA Daten- und Systemtechnik GmbH, Aachen	2016
	Software Engineer Intern , A.R. Bayer DSP Systeme GmbH, Düsseldorf	2012

Research Grants	Awarded	
	▪ [Etihad Airways] Conversational Booking Agents. PI: Nils Lukas , Co-PIs: Salem Lahlou, Alham Fikri, Martin Takac, Mingming Gong [450 000 USD]	2025
	▪ [United Al-Saqer Group] Privacy-preserving Brain Computer Interfaces. PI: Abdulrahman Mahmoud, Co-PIs: Nils Lukas , Elizabeth Churchill [136 000 USD]	2025
	Selected	
	▪ [TII Funding] GFlowNets for Fuzzing of Agentic Applications. Salem Lahlou & Nils Lukas [136 000 USD]	2025
	▪ [Amazon Special Call] AdvSim2Real: Simulating Adversarial Environments (EOI shortlisted), PI: Nils Lukas , Co-PI: Praneeth Vepakomma [100 000 USD]	2025
Teaching	Instructor , MBZUAI, UAE	
	▪ ML8502: Machine Learning Security (14 weeks)	2025
	▪ ML807: Federated Learning (7 weeks)	2025
	▪ ML818: Emerging Topics in Trustworthy Machine Learning (4 weeks)	2024
	Teaching Assistant , University of Waterloo, Canada	
	▪ CS458/658: Computer Security and Privacy	2020, 2021
	▪ CS246 - Object Oriented Programming	2021
	Co-Instructor , RWTH-Aachen, Germany	
	▪ Course: Data-driven Medicine	2018
Service	Area Chair	
	▪ International Conference on Learning Representations (ICLR)	2025
	Program Committee	
	▪ ACM Conference on Computer and Communications Security (CCS)	2025
	▪ ACM ASIA Conference on Computer and Communications Security	2025
	▪ IEEE Symposium on Security and Privacy (IEEE S&P)	2025, 2026
	▪ Recent Advances in Intrusion Detection (RAID)	2024
	Artifact Evaluation Committee	
	▪ The ACM Conference on Computer and Communications Security (CCS)	2023, 2024
	Reviewer	
	▪ NETYS	2025
	▪ ACM TheWebConf (WWW)	2025
	▪ International Conference on Learning Representations (ICLR)	2024, 2025
	▪ International World Wide Web Conference (TheWebConf)	2024
	▪ Recent Advances in Intrusion Detection (RAID)	2023
	▪ Neural Information Processing Systems (NeurIPS)	2022, 2023
	▪ International Conference on Machine Learning (ICML)	2022, 2025
	▪ The Conference on Information and Knowledge Management (CIKM)	2020
	Other	
	▪ Sub-Reviewer , Proceedings on Privacy Enhancing Technologies (PETS)	2021, 2022, 2023
	▪ Session Chair , IEEE Symposium on Security and Privacy (S&P)	2023
	▪ Organization , Workshop on Semantic Web Solutions for Large-Scale Biomedical Data Analytics (SeWebMeDA)	2018
	Student Board Member , Cybersecurity and Privacy Institute	2022, 2023, 2024
	School Advisory Committee on Appointments Liaison , CrySP Lab	2022