Franziska Boenisch
Tenure Track Faculty (CISPA)

+49 681 87083 2793
Saarbrücken, Germany
boenisch@cispa.de

GitHub: fraboeni
LinkedIn: fraboeni
https://franziska-boenisch.de/

ACADEMIC AND RESEARCH EXPERIENCE

Tenure Track Faculty   09 2023 — present
CISPA Institute, Saarbrücken, Germany
- Co-lead of the SprintML Research lab on Trustworthy Machine Learning

Postdoctoral Fellow   08 2022 — 08 2023
Vector Institute, Toronto, Canada
- Research on trustworthy and private machine learning from the perspective of individual users
- Supervised by Prof. Dr. Nicolas Papernot

Research Associate (Full-Time)   09 2019 — 08 2022
Fraunhofer AISEC, Berlin, Germany
- Research on differential privacy, and privacy quantification and metrics in machine learning models
- Project management, project acquisition in public domain and industry, grant writing, student advising

Ph.D. Research Intern (Full-Time)   07 2021 — 03 2022
Vector Institute for Artificial Intelligence, Toronto, Canada
- Research on privacy attacks against federated learning
- Research on privacy attacks in various domains and on differential privacy

Student assistant at the BioRobotics Lab (Part-Time, 20h/week)   02 2018 — 01 2019
Freie University, Berlin, Germany
- Implementation of an object tracking for honey bee trajectories in Matlab
- Collaboration in different research papers in the field of bio robotics and self-driving autonomous cars

Undergraduate Research Intern (Full-Time)   08 2016 — 09 2016
Chung Cheng University, Chiayi, Taiwan
- Supported by the DAAD RISE-Scholarship
- Implementation of neural networks for food image classification

Student assistant at the Data Analytics Lab (Part-Time, 20h/week)   02 2016 — 07 2016
Fraunhofer FOKUS, Berlin, Germany
- Prototype development and implementation of demonstrators in the field of predictive maintenance
- Implementation of applications with Apache Spark and Apache Flink

EDUCATION

Ph.D. Candidate   09 2019 — 11 2022
Freie University Berlin, Germany   *(Final Grade: summa cum laude)*
- Thesis: Secure and Private Machine Learning
- Advisors: Prof. Dr. Marian Margraf, Prof. Dr. Nicolas Papernot

M.Sc. Computer Science   10 2017 — 07 2019
Freie University Berlin, Germany   *(Final Grade: 1.0)*
- Thesis: "Differential Privacy: General Survey and Analysis of Practicability in the Context of Machine Learning"
- Advisor: Prof. Dr. Marian Margraf

Exchange Student   02 2019 — 07 2019
Technical University Eindhoven, Netherlands   *(Average 8.3/10)*
- Supported by the ERASMUS-Scholarship
- Relevant coursework: Artificial Intelligence, Statistics, Recommender Systems

B.Sc. Computer Science   04 2014 — 04 2017
Freie University Berlin   *(Final Grade: 1.2)*
- Thesis: "Feature Engineering and Probabilistic Tracking on Honey Bee Trajectories"
- Advisor: Prof. Dr. Tim Landgraf

PUBLICATIONS

[1] Haonan Duan, Adam Dziedzic, Nicolas Papernot, and Franziska Boenisch. Flocks of stochastic parrots: Differentially private prompt learning for large language models. In *Thirty-seventh Conference on Neural Information Processing Systems*, 2023. URL https://openreview.net/forum?id=u6Xv3FuF8N.

[2] Jan Dubiński, Stanisław Pawlak, Franziska Boenisch, Tomasz Trzcinski, and Adam Dziedzic. Bucks for buckets (b4b): Active defenses against stealing encoders. In *Thirty-seventh Conference on Neural Information Processing Systems*, 2023. URL https://openreview.net/forum?id=NfpYgGZC3B.

[3] Franziska Boenisch, Christopher Mühl, Adam Dziedzic, Roy Rinberg, and Nicolas Papernot. Have it your way: Individualized privacy assignment for dp-sgd. In *Thirty-seventh Conference on Neural Information Processing Systems*, 2023. URL https://openreview.net/forum?id=XXPzBhOs4f.

[4] Mohammad Yaghini, Patty Liu, Franziska Boenisch, and Nicolas Papernot. Learning with impartiality to walk on the pareto frontier of fairness, privacy, and utility. *arXiv preprint arXiv:2302.09183*, 2023.

[5] Franziska Boenisch, Adam Dziedzic, Roei Schuster, Ali Shahin Shamsabadi, Ilia Shumailov, and Nicolas Papernot. When the curious abandon honesty: Federated learning is not private. In *8th IEEE European Symposium on Security and Privacy (EuroS&P '23)*, 2023.

[6] Franziska Boenisch, Adam Dziedzic, Roei Schuster, Ali Shahin Shamsabadi, Ilia Shumailov, and Nicolas Papernot. Reconstructing individual data points in federated learning hardened with differential privacy and secure aggregation. In *8th IEEE European Symposium on Security and Privacy (EuroS&P '23)*, 2023.

[7] Matteo Giomi, Franziska Boenisch, Christoph Wehmeyer, and Borbála Tasnádi. A unified framework for quantifying privacy risk in synthetic data. In *23rd Privacy Enhancing Technologies Symposium (PoPETs)*, 2023.

[8] Franziska Boenisch, Christopher Mühl, Roy Rinberg, Jannis Ihrig, and Adam Dziedzic. Individualized pate: Differentially private machine learning with individual privacy guarantees. In *23rd Privacy Enhancing Technologies Symposium (PoPETs)*, 2023.

[9] Karla Pizzi, Franziska Boenisch, Ugur Sahin, and Konstantin Böttinger. Introducing model inversion attacks on automatic speaker recognition. In *Proc. 2nd Symposium on Security and Privacy in Speech Communication (SPSC)*, pages 11–16, 2022.

[10] Anvith Thudi, Ilia Shumailov, Franziska Boenisch, and Nicolas Papernot. Bounding membership inference. *arXiv preprint arXiv:2202.12232*, 2022.

[11] Adam Dziedzic, Haonan Duan, Muhammad Ahmad Kaleem, Nikita Dhawan, Jonas Guan, Yannis Cattan, Franziska Boenisch, and Nicolas Papernot. Dataset inference for self-supervised models. In *Neural Information Processing Systems (NeurIPS)*, 2022.

[12] Franziska Boenisch, Reinhard Munz, Marcel Tiepelt, Simon Hanisch, Christiane Kuhn, and Paul Francis. Side-channel attacks on query-based data anonymization. In *Proceedings of the 2021 ACM SIGSAC Conference on Computer and Communications Security (CCS)*, pages 1254–1265, 2021.

[13] Franziska Boenisch. A systematic review on model watermarking for neural networks. *Frontiers in Big Data*, 4, 2021.

[14] Peter Sörries, Claudia Müller-Birn, Katrin Glinka, Franziska Boenisch, Marian Margraf, Sabine Sayegh-Jodehl, and Matthias Rose. Privacy needs reflection: Conceptional design rationales for privacy-preserving explanation user interfaces. *Mensch und Computer Workshop*, 2021.

[15] Franziska Boenisch, Verena Battis, Nicolas Buchmann, and Maija Poikela. "I never thought about securing my machine learning systems": A study of security and privacy awareness of machine learning practitioners. In *Mensch und Computer 2021*, pages 520–546. 2021.

[16] Franziska Boenisch, Philip Sperl, and Konstantin Böttinger. Gradient masking and the underestimated robustness threats of differential privacy in deep learning. *arXiv preprint arXiv:2105.07985*, 2021.

[17] Tabea Kossen, Manuel Alexander Hirzel, Vince Istvan Madai, Franziska Boenisch, Anja Hennemuth, Kristian Hildebrand, Sebastian Pokutta, Kartikey Sharma, Adam Hilbert, Jan Sobesky, et al. Towards sharing brain images: Differentially private tof-mra images with segmentation labels using generative adversarial networks. *Frontiers in Artificial Intelligence*, page 85.

[18] Franziska Boenisch, Benjamin Rosemann, Benjamin Wild, David Dormagen, Fernando Wario, and Tim Landgraf. Tracking all members of a honey bee colony over their lifetime using learned models of correspondence. *Frontiers in Robotics and AI*, 5: 35, 2018.

Prizes and Honors

ICT Dissertation Award 2023, *Fraunhofer-Society IUK-Technology*	12 2023
Fraunhofer TALENTA Start Scholarship, *Fraunhofer Society*	01 2020 — 12 2021
3rd prize: Forum Junge Spitzenforscher, *German Industrial Research Foundation*	11 2020
German National Merit Foundation Scholarship, *Studienstiftung des deutschen Volkes*	04 2015 — 07 2019
Grace Hopper Celebration Travel Scholarship, *Hasso-Plattner-Institute*	09 2018
Taalunie Zomercursus Nederlands Scholarship, *Taalunie*	08 2018
DAAD RISE Research Scholarship, *DAAD (German Academic Exchange Service)*	08 2016 — 09 2016
Kulturweit Scholarship, *DAAD (German Academic Exchange Service)*	02 2013 — 02 2014
German Association of Mathematicians Higher Education Entrance Prize, *DMV (German Mathematical Society)*	07 2012

Services and Volunteering

Research Ethics Committees (RECs) Member for IEEE Symposium on Security and Privacy (IEEE S&P)	[2023]
PC member for IEEE Symposium on Security and Privacy (IEEE S&P)	[2022,2023]
PC member for IEEE Conference on Secure and Trustworthy Machine Learning (SaTML)	[2022,2023]
Reviewer for Conference on Neural Information Processing Systems (NeurIPS)	[2023]
PC member for Computer and Communications Security Conference (ACM CCS)	[2023]
PC member for Privacy Enhancing Technologies Symposium (PET)	[2023]
Co-organizer of ICLR'23 workshop on trustworthy ML under limited data and compute	10 2022 — present
Mentor at Women in ML workshop (NeurIPS'22)	12 2022
Co-organizer of Workshop "Trustworthy AI in Science and Society" at Informatik2022 conference	01 2022 — 09 2022
Reviewer for ICLR PAIR2Struct Workshop	01 2022
Mentor at CyberMentor, an online mentoring for female high school students in CS	03 2021 — present
Open source project contributor General Data Anonymity Score	09 2019 — 12 2020
Mentor at MINToring, mentoring program of female high school students in CS *Freie University Berlin*	04 2015 — 01 2019
Organizer of Summer School *ProInformatik VI: Python Programming for Female Students* *Freie University Berlin*	07 2019
Student assistant of the Women's Representative (Physics Department), *Freie University Berlin*	01 2017 — 01 2018
Deputy representative of students in the Central Women's Council, *Freie University Berlin*	01 2016 — 12 2017
Volunteer teacher with Kulturweit Voluntary Service, *German Consulate School Izmir, Turkey*	02 2013 — 02 2014
Student representative, *Rückert High School, Berlin*	09 2010 — 07 2012

Teaching

Seminar *Differential Privacy: Mathematical Foundations and Applications in Machine Learning*, *Saarland University*	Winter 2023
Seminar *Trustworthy Machine Learning*, *Freie University Berlin*	Summer 2022
Software Project *Privacy Evaluation of Machine Learning Models*, *Freie University Berlin*	Summer 2021
Teaching Assistant in *Security Protocols and Infrastructures*, *Freie University Berlin*	Winter 2020
Seminar *Machine Learning and IT-Security*, *Freie University Berlin*	Summer 2020
Seminar *Hello brand new data world*, *University of Bayreuth*	Summer 2020
Teaching Assistant in *Security Protocols and Infrastructures*, *Freie University Berlin*	Winter 2019
Lecture *ProInformatik VI: Python Programming for Female Students*, *Freie University Berlin*	Summer 2018
Girl's Day Workshop *Program your own App*, *Freie University Berlin*	Spring 2016, 2017, 2018

Current Students

W. Wang C. Mühl *(Self-Supervised Learning)*   Ph.D., CISPA

C. Mühl *(Individualized Privacy)*   Ph.D., Faunhofer AISEC

D. Wahdany *(Privacy Attacks)*   Ph.D., Faunhofer AISEC

R. Rinberg *(Individualized Privacy)*   Master, Columbia University

Past Students (University of Toronto)

M. Yaghini *(Privacy and Fairness)*   Ph.D., University of Toronto

C. Bruckmann *(Model Attribution)*   Undergraduate, University of Toronto

P. Liu *(Privacy and Fairness)*   Undergraduate, University of Toronto

H. Duan *(Privacy in Natural Language Processing)*   Ph.D., University of Toronto

J. Guan *(Reinforcement Learning)*   Ph.D., University of Toronto

Past Students (FU Berlin or Fraunhofer AISEC)

A. Meszaros *(Taxonomy of Privacy Attacks in Machine Learning)*   Undergraduate   link to thesis

M. Nest *(Practical Design of Privacy Attacks in Machine Learning)*   Master   link to thesis

I. Fendel *(Membership Inference Attacks against Deep Neural Networks)*   Undergraduate   link to thesis

M. Krüger *(Application and Evaluation of Differential Privacy in Health Data Classification Tasks)*   Undergraduate   link to thesis

O. Bouanani *(Neural Network Architectural Choices for Privacy)*   Undergraduate   link to thesis

C. Mühl *(Personalizing Private Aggregation of Teacher Ensembles)*   Master   link to thesis

T. Känel *(Practical Evaluation of Neural Network Watermarking Approaches)*   Undergraduate   link to thesis

D. Wang *(Evaluating and Adapting Existing NN Watermarking Approaches to Online Learning)*   Undergraduate   link to thesis

D. Sosnovchyk *(Evaluating Privacy of Synthetic Data Through Metrics)*   Undergraduate   link to thesis

W. Gu *(Differential Private Synthetic Data Generation)*   Undergraduate   link to thesis

J. Ihrig *(Privacy Quantification Methods for Private Aggregation of Teacher Ensembles)*   Master   link to thesis