Fumiyuki Kato

PhD student at Kyoto University
Yoshida-Honmachi, Sakyo, Kyoto 606-8501, Japan
Born in Shiga, Japan
Mail: fumilemon79 [at] gmail.com
Personal website: https://fumiyukikato.github.io/
Github: https://github.com/FumiyukiKato

BIOGRAPHY

Doctor of Informatics at Kyoto University   *April 2021 - present*

Focus on Privacy and Security of data engineering, especially on Differential Privacy, Federated Learning and Trusted Execution environment. (supervised by Prof. Yang Cao and Prof. Masatoshi Yoshikawa)

Visiting scholar at Emory University (U.S.)   *April 2023 - September 2023*

Research on privacy-preserving federated learning
supervised by Prof. Li Xiong [link]

JSPS student research fellow (DC2)   *April 2023 -*

Academic research on privacy enhancing technologies

Master of Informatics at Kyoto University   *April 2019 - March 2021*

Master Thesis: PCT-TEE: Trajectory-based Private Contact Tracing System with Trusted Execution Environment. (supervised by Prof. Yang Cao and Prof. Masatoshi Yoshikawa)

Bachelor of Informatics at Kyoto University   *April 2015 - March 2019*

Bachelor Thesis: Future Prediction based on Web News Articles with Publication Source and Time. (supervised by Prof. Makoto P. Kato and Prof. Masatoshi Yoshikawa)

PUBLICATIONS

[1]. **Fumiyuki, Kato**., Yang, Cao., & Masatoshi, Yoshikawa. OLIVE: oblivious federated learning on trusted execution environment against the risk of sparsification. In International Conference on Very Large Databases (VLDB). 2023.

[2]. Shun, Takagi., **Fumiyuki, Kato**., Yang, Cao., & Masatoshi, Yoshikawa. From Bounded to Unbounded: Privacy Amplification via Shuffling with Dummies. In IEEE Computer Security Foundations Symposium (CSF). 2023.

[3]. **Fumiyuki, Kato**., Tsubasa, Takahashi., Shun, Takagi., Yang, Cao., Seng Pei, Liew., & Masatoshi, Yoshikawa. HDPView: Differentially Private Materialized View for Exploring High Dimensional Relational Data. In International Conference on Very Large Databases (VLDB). 2022.

[4]. Seng Pei, Liew., Tsubasa, Takahashi., Shun, Takagi., **Fumiyuki, Kato**., Yang, Cao., & Masatoshi, Yoshikawa. Network Shuffling: Privacy Amplification via Random Walks. In International Conference on Management of Data (SIGMOD). 2022.

[5]. Shun, Takagi., **Fumiyuki, Kato**., Yang, Cao., & Masatoshi, Yoshikawa. Asymmetric Differential Privacy. In IEEE International Conference on Big Data (BigData). 2022.

[6]. Ruixuan, Cao., **Fumiyuki, Kato**., Yang, Cao., & Masatoshi, Yoshikawa. An Accurate, Flexible and Private Trajectory-based Contact Tracing System. In Information Integration and Web Intelligence. (iiWAS). 2022.

[7]. **Fumiyuki,Kato**., Yang, Cao., & Masatoshi, Yoshikawa. PCT-TEE: Trajectory-based Private Contact Tracing System with Trusted Execution Environment. In ACM Transactions on Spatial Algorithms and Systems (TSAS). 2021.

[8]. **Fumiyuki,Kato**., Yang, Cao., & Masatoshi, Yoshikawa. Preventing Manipulation Attack in Local Differential Privacy using Verifiable Randomization Mechanism. In 35th Annual IFIP WG 11.3 Conference, DBSec (DBSec). 2021.

[9]. **Fumiyuki,Kato**., Yang, Cao., & Masatoshi, Yoshikawa. Secure and Efficient Trajectory-Based Contact Tracing using Trusted Hardware. In 7th International Workshop on Privacy and Security of Big Data at IEEE BigData (BigData). 2020.

[10]. Zheng, Wen., Keping, Yu., Xin, Qi., Toshio, Sato., Yutaka, Katsuyama.,Takuro, Sato., Wataru, Kameyama., **Fumiyuki,Kato**., Yang, Cao., Masatoshi, Yoshikawa., Min, Luo., & Jun, Hashimoto. Blockchain-empowered Contact Tracing for COVID-19 Using Crypto-spatiotemporal Information. In IEEE International Conference on E-health Networking, Application & Services (HEALTHCOM). 2020.

PREPRINT

[1]. **Fumiyuki,Kato**., Li, Xiong., Shun, Takagi., Yang, Cao., Masatoshi, Yoshikawa. ULDP-FL: Federated Learning with Across Silo User-Level Differential Privacy. `https://arxiv.org/abs/2308.12210`. Arxiv 2023.

AWARDS

- (Feb.2022) Excellent Research Award at Kyoto University's 16th ICT Innovation
- (March.2021) Student Presentation Award (DEIM 2021)
- (March.2021) Master thesis award of social informatics department of Kyoto University
- (March.2020) Student Presentation Award (DEIM 2020)

FUNDING

- (April.2023 - March.2025) JSPS student research fellow (DC2). (2,400,000 yen / year)
- (April.2023) Overseas Challenge Program for Young Researchers. (1,400,000 yen)
- (April.2021 - March.2023) Kyoto University AI/Data science Fellowship. (2,100,000 yen / year)
- (March.2021) Exemption from repayment of scholarships of JASSO due to outstanding achievements.

SKILLS AND QUALIFICATIONS

Programming Languages

Advanced	Python
Basic	Rust, Perl, Java, JS/TS, PyTorch, AWS/GCP, Intel SGX

Languages

Native tongue Japanese
Basics English

WORK EXPERIENCE

Data engineer (intern) at Recruit Co.,Ltd.   *October 2022 - November 2022*

    Investigated and developed PoC of Bandit-based ML enhancement.

Software engineer (intern) at Preferred Networks Co.,Ltd. *August 2022 - September 2022*

    Developed over the air system.

Research intern at LINE Corporation.   *August 2020 - March 2021*

    Research privacy enhanced technologies.

Web application engineer (part-time) at Hatena Inc.   *May 2019 - Aug 2020*

    Developing backend and frontend of large scale web applications mainly using Perl and Javascript.

Software engineer (intern) at Recruit Co.,Ltd.   *October 2019 - November 2019*

    Developing backend and frontend large scale web applications mainly using Spring Boot and Java.

Data scientist (intern) at Wantedly Inc.   *September 2019*

    Working on proof of concept of a recommendation of a web application using Python and Ruby and BigQuery.

ML engineer (intern) at M3 Inc.   *August 2019*

    Developing backend infrastructure of recommendation service of web applications mainly using Scala and Kubernetes.

Software engineer (part-time) at MediaMaxJapan Inc.   *July 2018 - March 2019*

    Developing web applications mainly using Kotlin and Typescript. In particular, I was able to experience development that strictly followed DDD.

Software engineer (part-time) at KiizanKiizan Inc.   *February 2018 - May 2018*

    Developing web applications mainly using Ruby.