Jinyeong Seo

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Overview

I am a graduate student at Seoul National University, advised by Prof. Yongsoo Song. My research interest lies in (but is not limited to) the practical instantiation of cryptographic protocols using techniques from lattice-based cryptography. Specifically, my recent research focuses on improving the performance of lattice-based proof systems and homomorphic encryption schemes. I also have broad interests in the theoretical foundations of cryptographic proofs.

Education

Seoul National University Seoul, South Korea
Ph.D. in Computer Science Mar. 2022 – Present
Advisor: Prof. Yongsoo Song

Korea Advanced Institute of Science & Technology Daejeon, South Korea
B.S. in Mathematical Science Mar. 2016 – Aug. 2021
(double major: computer science)

Publications

Authors are listed in alphabetical order by last name, unless an asterisk(*) is indicated.

Conferences

[C05] **Optimizing HE operations via Level-aware Key-switching Framework**
Intak Hwang, Jinyeong Seo, Yongsoo Song.
To appear at *WAHC 2023.*

[C04] **Asymptotically faster multi-key homomorphic encryption from homomorphic gadget decomposition**
Taechan Kim, Hyesun Kwak, Dongwon Lee, Jinyeong Seo, Yongsoo Song.
To appear at *ACM CCS 2023.*

[C03] **Toward Practical Lattice-based Proof of Knowledge from Hint-MLWE**
Duhyeong Kim, Dongwon Lee, Jinyeong Seo, Yongsoo Song.
CRYPTO 2023.

[C02] **Accelerating HE Operations from Key Decomposition Technique**
Miran Kim, Dongwon Lee, Jinyeong Seo, Yongsoo Song.
CRYPTO 2023.

[C01] **Faster TFHE Bootstrapping with Block Binary Keys**

Changmin Lee, Seonhong Min, Jinyeong Seo, Yongsoo Song.
ACM ASIA CCS 2023.

Journals

[J01] ***HEaaN-STAT: a privacy-preserving statistical analysis toolkit for large-scale numerical, ordinal, and categorical data**
Younho Lee, Jinyeong Seo, Yujin Nam, Jiseok Chae, Jung Hee Cheon
IEEE TDSC 2023.

Manuscripts

[M01] **Efficient Lattice-based Sublinear Arguments for R1CS without Aborts**
Intak Hwang, Jinyeong Seo, Yongsoo Song.

Experiences

CryptoLab Inc. Seoul, South Korea
- Researcher Sep. 2019 – Mar. 2020
- Intern Jun. 2019 – Aug. 2019
- Developed HEaaN-STAT, homomorphic encryption-based statistical analysis toolkit.

eWBM Inc. Seoul, South Korea
- Intern Jun. 2018 – Aug. 2018
- Developed ECDH PKI protocols for secure communication on LoRa devices.

Talks

Practical Lattice-based Private Stream Aggregation and Application to Federated Learning Aug. 2023
The 5th Privacy-Preserving Machine Learning Workshop 2023

Awards

Korea Cryptography Contest Oct. 2023
Top Award ($10, 000) National Security Research Institute

29th Samsung Humantech Paper Award Feb. 2023
Silver Award ($7, 000) Samsung Electronics

Korea Cryptography Contest Oct. 2022
Excellence Award ($2, 000) National Security Research Institute

GitHub Repositories

`https://github.com/SNUCP/level-aware-ksw` PoC Implementation of [C05]
`https://github.com/SNUCP/snu-mghe` PoC Implementation of [C04]
`https://github.com/SNUCP/fast-ksw` PoC Implementation of [C02]
`https://github.com/SNUCP/blockkey-tfhe` PoC Implementation of [C01]

Skills

Programming : C, C++, Go, Python