SEUNGWAN HONG

Curriculum Vitae

CONTACT INFORMATION

Affiliation Department of Mathematical Sciences, Seoul National University

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EDUCATION

Seoul National University, Republic of Korea

Integrated M.S./Ph.D. in Mathematical Sciences Sep 2016 - Present

Advisor: Prof. Jung Hee Cheon

B.S. in Mathematical Sciences Mar 2010 - Aug 2016

Honers: Cum Laude (Major GPA: 3.92/4.3)

RESEARCH INTERESTS

• Homomorphic Encryption

- Algorithms for Homomorphic Non-Arithmetic Operations
- Privacy-Preserving Machine Learning
 - Logistic regression over large-scale encrypted data
- Functional Encryption
 - Construction of functional encryption scheme

PUBLICATIONS

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

Conference

1. *Kyoohyung Han, **Seungwan Hong**, Jung Hee Cheon and Daejun Park. "Logistic Regression on Homomorphic Encrypted Data at Scale." In Innovative Applications of Artificial Intelligence (IAAI), 2019.

Journal

- 5. *Miran Kim, *Arif Harmanci, Jean-Philippe Bossuat, Sergiu Carpov, Jung Hee Cheon, Ilaria Chillotti, Wonhee Cho, David Froelicher, Nicolas Gama, Mariya Georgieva, **Seungwan Hong**, Jean-Pierre Hubaux, Duhyeong Kim, Kristin Lauter, Yiping Ma, Lucila Ohno-Machado, Heidi Sofia, Yongha Son, Yongsoo Song, Juan Troncoso-Pastoriza and Xiaoqian Jiang. "Ultra-Fast Homomorphic Encryption Models enable Secure Outsourcing of Genotype Imputation." In Cell Systems, 2021.
- 4. *Seungwan Hong, Seunghong Kim, Jiheon Choi, Younho Lee, and Jung Hee Cheon, "Efficient Sorting of Homomorphic Encrypted Data with k-way Sorting Network." In IEEE Transactions on Information Forensics and Security, 2021.
- 3. *Duhyeong Kim, Yongha Son, Dongwoo Kim, Andrey Kim, **Seungwan Hong** and Jung Hee Cheon, "Privacy-preserving Approximate GWAS computation based on Homomorphic Encryption." In BMC Medical Genomics, 2020.

- 2. Jung Hee Cheon, Minki Hhan, Seungwan Hong and Yongha Son, "A Hybrid of Dual and Meet-inthe-Middle Attack on Sparse and Ternary Secret LWE." In IEEE Access, 2019.
- 1. *Sungjoon Park, Minsu Kim, Seokjun Seo, **Seungwan Hong**, Kyoohyung Han, Keewoo Lee, Jung Hee Cheon and Sun Kim, "A secure SNP panel scheme using homomorphically encrypted K-mers without SNP calling on the user side." In BMC Genomics, 2019.

Preprint

- 2. *Seungwan Hong, Jai Hyun Park, Wonhee Cho, Hyeongmin Choe and Jung Hee Cheon, "Secure Multi-Label Tumor Classication Using Homomorphic Encryption." Submitted.
- 1. Jung Hee Cheon, Seungwan Hong, and Duhyeong Kim, "Remark on the Security of CKKS Scheme in Practice." In IACR Cryptol. ePrint Arch.

TALKS

International

Secure multi-label Tumor Classification using HEaaN IDASH PRIVACY & SECURITY WORKSHOP 2020. Online Dec 2020

Domestic

Introduction to HEaaN and its Applications

July 2020

National Tax Service, Saejong, Korea

TEACHING EXPERIENCE

Introduction to Cryptography	Mar 2019 - Jun 2019
Introduction to Combinatorics	Mar 2019 - Jun 2019
Differential and Integral Calculus	Sep 2016 - Jun 2019

GRANT & AWARDS

International

iDASH 2020 Dec 2020 First Winner of Track 1 National institutes of Health (NIH) iDASH 2019 Oct 2019

Second Winner of Track 2 National institutes of Health (NIH)

Domestic

Korea Cryptography Contest Nov 2019 Excellent Award (\$1,500) Korea Institute of Information Security and Cryptology

Awards for Excellence in Teaching Sep 2017 For teaching Differential and Integral Calculus Seoul National University

University Students Contest for Mathematics Nov 2015

Bronze Medal Korean Mathematical Society

Korean Mathematical Olympiad Nov 2009

Silver Medal Korean Mathematical Society

INTERNSHIP

NCSOFT, Korea

Game AI Development

Jun 2017 - Aug 2017

GITHUB REPOSITORIES

https://github.com/idashSNU/Imputation

iDASH 2019 Solution (team SNU)

https://github.com/swanhong/HybridLWEAttack Bit-security estimation of hybrid MITM attack

DOCKER REPOSITORIES

swanhong/k_way_sort_enc

Secure Sorting Algorithm using CKKS scheme

swanhong/idash2020

iDASH 2020 Solution (team SNU)

LANGUAGES AND SKILLS

Languages

Korean (native), English (Proficient)

Skills

C/C++, Python, LATEX