SEUNGWAN HONG

Curriculum Vitae

CONTACT INFORMATION

Affiliation	Department of Mathematical Sciences, Seoul National University
Address	1, Gwanak-ro, Gwanak-gu, Seoul, Republic of Korea, 08826
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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
Honors: *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-in-the-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 Classification 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 Dec 2020
IDASH PRIVACY & SECURITY WORKSHOP 2020, Online (see here)

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 Jun 2017 - Aug 2017
Game AI Development

GITHUB REPOSITORIES

`https://github.com/snucrypto/HEAAN`	Code Maintenance (Mar 2021 - Present)
`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