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-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 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   Dec 2020
IDASH PRIVACY & SECURITY WORKSHOP 2020, Online

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/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