





Wonseok Choi

 choiwons |  wonseok-choi |  choiwons.github.io
 wonseok.choi@snu.ac.kr |  Google Scholar

EDUCATION

2024 – Present **Ph.D. Candidate** in Electrical and Computer Engineering, Seoul National University
2018 – 2024 **B.S.E. in Electrical and Computer Engineering**, Seoul National University

RESEARCH INTERESTS

My research interests lie in accelerating emerging workloads on GPUs and specialized accelerators through algorithm–architecture co-design. More specifically, I focus on GPU-based acceleration of fully homomorphic encryption (FHE) and private information retrieval (PIR), covering high-performance libraries and applications in privacy-preserving machine learning (PPML) and secure data access.

I develop high-performance GPU kernels (e.g., NTT, BConv, GEMM) and large-scale FHE libraries through automated design space exploration, detailed profiling, and algorithmic optimization. My recent work investigates GPU architectural limitations and hardware support for secure computation.

PUBLICATIONS

- GPIR: Enabling Practical Private Information Retrieval with GPUs** 2026
Hyesung Ji, Hyunah Yu, Jongmin Kim, **Wonseok Choi**, G. Edward Suh, Jung Ho Ahn
ICS 2026
- Theodosian: A Deep Dive into Memory-Hierarchy-Centric FHE Acceleration** 2026
Wonseok Choi, Hyunah Yu, Jongmin Kim, Hyesung Ji, Jaiyoung Park, Jung Ho Ahn
ISPASS 2026
- A Five-Year Journey to Accelerate Homomorphic Encryption with GPUs, Demonstrated by Sub-25ms CNN Inference** 2026
Wonseok Choi[†], Sangpyo Kim[†], Jaiyoung Park, Jung Ho Ahn
IEEE Micro
- Cheddar: A Swift Fully Homomorphic Encryption Library for CUDA GPUs** 2026
Wonseok Choi[†], Jongmin Kim[†], Jung Ho Ahn
ASPLOS 2026
- IVE: An Accelerator for Single-Server Private Information Retrieval Using Versatile Processing Elements** 2026
Sangpyo Kim, Hyesung Ji, Jongmin Kim, **Wonseok Choi**, Jaiyoung Park, Jung Ho Ahn
HPCA 2026
- Anaheim: Architecture and Algorithms for Processing Fully Homomorphic Encryption in Memory** 2025
Jongmin Kim, Sungmin Yun, Hyesung Ji, **Wonseok Choi**, Sangpyo Kim, Jung Ho Ahn
HPCA 2025

[†] Equal contribution.

SOFTWARE

2026 **Cheddar**: A CUDA GPU library for fully homomorphic encryption

HONORS AND GRANTS

2026 Student Grant, ASPLOS 2026
2026 Student Grant, ISCA 2026
2026 Outstanding Research Talent Fellowship Scholarship, Seoul National University, 2026 Spring
2025 Cheongpa Scholarship Foundation Scholarship, 2025 Fall
2024 – Present Brain Korea 21 (BK21) Scholarship
2018 – 2022 Korea Presidential Science Scholarship, full scholarship

ACADEMIC SERVICE

Organizer Cheddar Tutorial Session, ISCA 2026
Reviewer IEEE Transactions on Very Large Scale Integration (VLSI) Systems
Reviewer ACM Transactions on Architecture and Code Optimization

POSTERS

2025 **GPU-Driven FHE: Real-Time Private AI Inference Outperforming Custom ASIC**
Wonseok Choi, Jongmin Kim, Jaiyoung Park, Sangpyo Kim, Hyesung Ji, Jung Ho Ahn
NVIDIA GTC 2025 (San Jose, CA)

SKILLS

C, C++, CUDA, PyTorch, Python, Verilog