

JIHYUNG KOOK

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Address: Seoul, South Korea

RESEARCH INTERESTS

Verifiable & Privacy-Preserving Computation, Applied Cryptography (HE, MPC, ZKPs)

EDUCATION

Georgia Institute of Technology

Online M.S. in Computer Science

Atlanta, GA

Dec. 2024

- Specialization: Computational Perception & Robotics

Sookmyung Women's University

B.S. in Statistics and Computer Science

Seoul, Korea

Feb. 2017

MANUSCRIPTS

[1] **Kook, J.**, Kang, D., Lee, E., “Sparsification-Friendly CKKS-Based Federated Learning via RLWE-to-MLWE Conversion,” manuscript in preparation.

[2] **Kook, J.**, Kim, S., Vakudavathu, P. C. S., “Sensitive Information Leakage from Tool-Call Traces,” manuscript submitted to the *NeurIPS 2026 AIWild and InfPriv Workshops*, Sep. 2026.

[3] Yoo, S., Oh, T., **Kook, J.**, et al., “Association between Muscle Cramping and Diabetic Peripheral Neuropathy: Findings from a Prospective Cohort Study,” *Diabetes & Metabolism Journal*, under review, Jun. 2026.

PUBLICATIONS & PRESENTATIONS

[1] **Kook, J.**, Lee, E., “Efficiency Evaluation of Sparsified Homomorphic Encryption in Federated Learning,” Poster presented at the *Korean Institute of Communications and Information Sciences (KICS) Fall Conference*, Nov. 2025.

[2] Oh, T., **Kook, J.**, Jung, S., et al., “A Standardized Glucose-Insulin-Potassium Infusion Protocol in Surgical Patients: Use of Real Clinical Data from a Clinical Data Warehouse,” *Diabetes Research and Clinical Practice*, vol. 174, 108756, Apr. 2021, DOI: 10.1016/j.diabres.2021.108756.

[3] Yoon, H., **Kook, J.**, Shim, J., “IoT-based Mailbox system using Android and Arduino,” Poster presented at the *Korea Information Processing Society (KIPS) Spring Conference*, Apr. 2015, DOI: 10.3745/PKIPS.y2015m04a.1080.

RESEARCH EXPERIENCE

Sejong University—Privacy-Preserving Machine Learning and Cryptography Lab

Seoul, Korea

Full-time Researcher (Advisor: Prof. Eunsang Lee)

Jul. 2025 – Present

- Contribute to a team developing a communication-efficient encrypted federated learning framework based on threshold CKKS and RLWE-to-MLWE conversion, supporting sparse and full aggregation, residual accumulation of untransmitted updates, and client dropout.
- Lead the experimental design and evaluation by developing a plaintext implementation of the proposed protocol, screening chunk granularities and communication budgets in plaintext, and validating selected configurations through OpenFHE/C++ ciphertext experiments.
- Analyze trade-offs among model accuracy, encrypted computation time, and communication cost, finding that finer-grained chunks improve the selection of high-impact updates and preserve accuracy under constrained communication.

Independent Research—Adversarial Analysis of Verifiable Model Certification

Remote

Co-organizer, Georgia Tech OMSCS ZKP Study Group

Aug. 2026 – Present

- Explore whether a malicious model trainer can exploit gaps between statements verified by zero-knowledge model-certification procedures and the model properties those procedures are intended to guarantee.
- Refine the problem formulation through literature review, study-group discussions, and ongoing feedback from a Georgia Tech faculty member.

Independent Research—Privacy Leakage in Agentic AI

Research Collaborator

Remote

Jul. 2026 – Sep. 2026

- Investigated privacy leakage from zero-payload tool-call traces by developing and evaluating MLP classifiers of varying depths on 3,190 simulated healthcare-agent traces.
- Compared chronological n-gram features with order-agnostic Bag-of-Tools representations across three sensitive-attribute prediction tasks, finding that tool identities and usage frequencies remained predictive without invocation order.

Seoul National University Bundang Hospital (SNUBH)

Part-time Researcher, Division of Endocrinology & Metabolism (Advisor: Prof. Tae Jung Oh)

Seongnam, Korea

Mar. 2018 – Jul. 2020

- Contributed to journal publication on a standardized glucose-insulin-potassium infusion protocol by preprocessing and analyzing large-scale clinical datasets of 7,000+ patients.
- Engineered features from continuous glucose monitoring (CGM) data of 55 patients using Python, extracting clinically meaningful predictors (e.g., peak occurrence, variability metrics).

PROFESSIONAL EXPERIENCE

Seoul National University Bundang Hospital

Part-time Administrative Assistant (Research Support), Division of Endocrinology & Metabolism

Seongnam, Korea

Jul. 2025 – Present

- Preprocess, merge, and analyze EMR datasets with Python to support clinical studies and manuscript preparation, including statistical analyses such as Student's t-test and Cohen's d.
- Manage research administration including payroll, publication and IRB review fees, and training expenses, ensuring budgeting accuracy and institutional compliance.
- Support preparation of the SNUBH site for a Korea Disease Control and Prevention Agency (KDCA)-funded multicenter pragmatic randomized clinical trial on personalized risk score-based management for older adults with type 2 diabetes.

KB Kookmin Bank & KB Financial Group

Junior Data Analyst, Department of Data Planning

Seoul, Korea

Jul. 2020 – Sep. 2023

- Standardized customer data across 8 subsidiaries by organizing records into common data domains and implementing retention/deletion rules, improving cross-subsidiary integration and regulatory compliance.
- Coordinated cross-subsidiary data governance and training initiatives, contributing to a 20% cleanup of legacy records and a refresh of 10% of high-value datasets, while improving data quality and reporting.

Croquis Inc. (now Kakao Style)

Junior Data Analyst, Department of Data

Seoul, Korea

Mar. 2018 – Apr. 2020

- Automated 17 ETL workflows using PySpark and SQL, improving the accuracy and reliability of customer analytics pipelines by 25%.
- Analyzed user and transaction data for a newly introduced in-app payment system and developed dashboards and recommendation analyses, contributing to 1.5× higher monthly sales among early-adopting sellers.

ADDITIONAL TRAINING

Big Data Platform Technology Program (Government-funded)

4th Industrial Revolution Academy – Seoul National University Big Data Institute

Seoul, Korea

Jun. 2017 – Feb. 2018

- Completed intensive courses in Python, SQL/DBMS, data mining, and machine/deep learning.

TECHNICAL SKILLS

Programming & Tools: Python, PyTorch, C/C++, SQL, R, PySpark

Cryptography & Privacy: Homomorphic Encryption (CKKS), OpenFHE, Federated Learning

Systems & Research Tools: Git, Docker, Linux, LaTeX

Data Analysis & Visualization: Statistical Modeling, Matplotlib, ggplot2, Shiny, Tableau