

Jihyung Kook

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Seoul, South Korea

RESEARCH INTERESTS

My research interests focus on **data privacy**, particularly in **privacy-preserving machine learning**. I am interested in exploring practical methods for secure and efficient training and unlearning on sensitive data, drawing on **cryptographic approaches** such as homomorphic encryption as needed, to help ensure trustworthy, and scalable AI.

Keywords: Data Privacy, Privacy-Preserving Machine Learning (PPML), Cryptography

EDUCATION

- **Georgia Institute of Technology** Dec. 2024
M.S. in Computer Science (OMSCS) GA, USA
 - Specialization: Computational Perception & Robotics
- **Sookmyung Women's University** Feb. 2017
B.S in Statistics and Computer Science (Double Major) Seoul, South Korea

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [J.1] Tae-jung Oh, **Ji-hyung Kook**, Se Young Jung, et al. (2021). **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*, 174, 108756. DOI: 10.1016/j.diabres.2021.108756

RESEARCH EXPERIENCE

- **Privacy-Preserving Machine Learning and Cryptography Lab** Jul. 2025 - Present
Researcher Seoul, South Korea
 - Conducting literature review and foundational study in cryptography, focusing on homomorphic encryption for PPML; presenting key takeaways in weekly lab meetings.
 - Running preliminary experiments on encrypted federated learning to quantify efficiency-accuracy trade-offs across sparsification settings.
 - Drafting a manuscript on homomorphic encryption for federated learning, to be submitted to the Korean Institute of Communications and Information Sciences (KICS) Fall Conference 2025 (submission Oct. 2025).
 - Supervisor: [Prof. Eunsang Lee](#)
- **Course Project: CS 8803 O24 (Intro to Research)** May 2025 - Jul. 2025
Graduate Course Project Atlanta, GA, USA
 - Developed a research proposal on homomorphic encryption for Privacy-Preserving Machine Learning, exploring how Systematic Literature Review (SLR) methodology could be applied to identify adoption barriers.
 - Gained hands-on experience with SLR and structured peer review through a collaborative group project, including study screening, synthesis, and iterative feedback.
- **Seoul National University Bundang Hospital** Mar. 2018 - Mar. 2021
Part-time Research Assistant Bundang, South Korea
 - Contributed to a publication in *Diabetes Research and Clinical Practice* on a standardized glucose-insulin-potassium infusion protocol by preprocessing and analyzing large-scale clinical datasets (7,000+ patients).
 - Performed an exploratory analysis of continuous glucose monitoring (CGM) data from 55 patients, evaluating data quality and patterns as a preliminary step toward identifying predictors of glycemic control.
 - Supervisor: [Prof. Tae-jung Oh](#)

ACADEMIC ACTIVITIES & CLUBS

- **DS@GT Research Club** Sep. 2025 - Present
Member Atlanta, GA, USA
 - Preparing weekly slide decks aligned with seminar topics (e.g., literature review, CLEF) and contributing to group discussions; scheduled to present a research proposal in Oct. 2025.
- **Graduate Seminars (Georgia Tech Professional Education)** Sep. 2025 - Dec. 2025
Participant Atlanta, GA, USA
 - Attending two research-oriented seminars: *Machine Learning for Sensor-Based Human Activity Recognition (COMP 1019P)* and *Understanding Animal Communication and Behavior with AI (COMP 1018P)*.
 - Reviewing literature and engaging with Ph.D. student presentations on topics such as HAR pipelines, self-supervised learning, and AI for multimodal animal communication.
 - Gaining hands-on experience applying deep learning to time-series data as part of seminar projects.

PROFESSIONAL EXPERIENCE

- **Seoul National University Bundang Hospital** Jul. 2025 - Present
Part-time Research Administrative Assistant Bundang, South Korea
 - Managing research administration tasks including payroll processing, publication fees, IRB review fees, and training expenses, ensuring accurate budgeting and compliance with institutional guidelines.
 - Providing on-demand data support for clinical research, including dataset preprocessing, merging, and extraction from Electronic Medical Records (EMR), enabling timely analyses and manuscript preparation.
- **KB Kookmin Bank (concurrent with KB Financial Group)** Jul. 2020 - Sep. 2023
Data Analyst, Department of Data Planning Seoul, South Korea
 - Standardized customer data across 7 subsidiaries, organizing records into 8 domains and implementing retention/deletion rules, which improved cross-subsidiary integration and ensured full regulatory compliance.
 - Coordinated bi-monthly cross-subsidiary meetings with data managers to resolve data quality and integration issues, resulting in the cleanup of 20% legacy records and the refresh of 10% high-value datasets, improving reliability of the group database.
 - Delivered group-wide training (7 subsidiaries) and one-on-one coaching on data visualization and automation, improving digital adoption and reporting efficiency.
- **Croquis Inc. (Kakao Style / Zigzag)** Mar. 2018 - Apr. 2020
Junior Data Analyst, Department of Data Seoul, South Korea
 - Automated 17 ETL workflows on PySpark using Python and PySQL to standardize customer analysis criteria across teams, increasing data accuracy by 15% and improving reporting reliability.
 - Analyzed user and transaction data after introducing an in-app payment system; improved recommendation algorithms and automated promotion reports, leading to early-adopting sellers achieving 1.5x higher monthly sales compared to their pre-adoption performance.
 - Collaborated with PMs, designers, and engineers to define KPIs focused on expanding Top-100 seller participation (out of 400+ shops), and built Tableau/R-Shiny dashboards to track adoption and performance, supporting strategies to boost overall sales volume.
 - Delivered cross-team training in SQL and Tableau, enhancing organizational data literacy and enabling non-technical staff to use data in decision-making; this reduced the data team's workload by 7% through increased self-service capabilities.

CERTIFICATES & TRAINING

- **Seoul National University 4th Industrial Revolution Academy - Big Data Platform Technology** Jun. 2017 - Feb. 2018
Seoul National University Big Data Institute Seoul, South Korea
 - Completed intensive coursework in Python, SQL/DBMS, distributed systems, data mining, and machine learning/deep learning.
 - Conducted an exploratory study at Seoul National University Bundang Hospital on predictive factors from Continuous Glucose Monitoring (CGM) data, receiving weekly one-on-one mentorship from a professor in endocrinology as well as guidance from a computer science professor and PhD students, gaining early interdisciplinary research training.

SKILLS

- **Programming & Tools:** Python, PyTorch, R, SQL, PySpark, C/C++, Git, Docker, LaTeX
- **Machine Learning & Security:** Privacy-Preserving Machine Learning (Federated Learning, Homomorphic Encryption), Deep Learning, Statistical Modeling
- **Data Visualization:** Matplotlib, ggplot2, R-Shiny, Tableau

VOLUNTEER EXPERIENCE

- **ForCatMung Center** Sep. 2025 - Present
Volunteer Ansan, South Korea
 - Contributing to monthly shelter activities, including cleaning dog and cat kennels, walking dogs, and feeding animals, supporting the care and well-being of rescued pets.
- **2025 Animal Run Seoul** Oct. 2025
Participant Seoul, South Korea
 - Completed a 10 km charity run to raise awareness and donations for endangered animals.