# SeokHyeon (Lucas) Kong

lucasshkong@gmail.com | https://lucasshkong.github.io/

## RESEARCH INTERESTS

Computer Architecture, Quantum Computer Systems and Architectures in the broadest sense, Fault-Tolerant Quantum Computers, Quantum Error Correction

## EDUCATION

**Sungkyunkwan University (SKKU)** — **Seoul, South Korea**
*College of Information and Communication Engineering* — *February 2026 (Expected)*
Bachelor of Science in Electronic and Electrical Engineering — **GPA: 3.95/4.0 (4.37/4.5)**
Bachelor of Science in Advanced Semiconductor Engineering — System Architecture Track

**The Pennsylvania State University** — **University Park, PA**
*School of Electrical Engineering and Computer Science (EECS)* — *Fall 2024*
Exchange Student in Computer Engineering — **Grade: 4.0/4.0**

## PUBLICATIONS

**SeokHyeon Kong**, Dongwhan Kim, Kiwan Meang*, Euiseong Seo*, *"*Characterizing the System Overhead of Discrete Gaussian Noise Generation for Differential Privacy*," IEEE Computer Architecture Letters*, 2025. (In Preparation)

**SeokHyeon Kong** and Ha-young Oh*, "Predicting Key Regional Real Estate Prices Using Machine Learning Technique: with an emphasis on Jeonsae system," *The Journal of the Korean Institute of Information and Communication Engineering*, Oct. 2023

## RESEARCH EXPERIENCE

**Research Mentee** — **Remote**
*IonQ, Advised by Dr. Denny Dahl* — *08/2025-09/2025*

- Solved the Four Corners Map Coloring problem using a Variational Quantum Algorithm.
- Applied graph-theoretic approaches to the Instant Insanity problem on NISQ devices.

**Undergraduate Research Intern** — **Suwon, South Korea**
*Arch Lab @ SKKU, Advised by Prof. Dongmoon Min* — *07/2025-08/2025*

- Academically trained in the field of Quantum / Cryogenic Computer Systems; developed foundational expertise through presentations and defenses.
- Explored cryogenic computer architecture - processors, interconnects, caches, and memory - as well as quantum computer systems with a focus on superconducting qubits.

**Undergraduate Researcher** — **University Park, PA**
*Penn State CSE, Advised by Prof. Kiwan Maeng* — *08/2024-09/2025*

- Performed in-depth GPU profiling using Nsight Compute and Nsight Systems to analyze performance bottlenecks and system-level overhead in differentially private training.

- Conducted Differentially Private Stochastic Gradient Descent (DP-SGD) experiments on multiple models and datasets to characterize system overhead.

**Undergraduate Research Intern** **Pohang, South Korea**
*POSTECH QCQN (Quantum Computing and Quantum Networks)* *01/2025*

- Performed 397 nm fluorescence (Doppler) and 729 nm quadrupole spectroscopy on $Ca^+$ ions and enhanced system stability through targeted adjustments.
- Implemented micromotion optimization via 2D scanning with DC compensation rods to enhance ion trapping stability.

## HONORS & AWARDS

Quantum Hackathon - Director's Award *2025*

President's List (Honor Society, **2 consecutive years**) *2024, 2025*

Dean's List (**5 consecutive semesters**) *SP2023, FA2023, SP2024, FA2024, SP2025*

Korea-U.S. Student Exchange Program *FA2024*
in the field of high-tech industry; Scholarship Award ($9,000)

Student Success Scholarship *2023*

## TEACHIING EXPERIENCE

**Academic Tutor** **Suwon, South Korea**
*Sungkyunkwan University (SKKU), Intro to Electromagnetism* *09/2023-12/2023*

- Taught blue collar workers of Samsung Semiconductor, who study Material-Component Convergence Engineering, at SKKU.
- Primarily focused on problems not covered in class.

**International Summer School Teaching Assistant** **Seoul, South Korea**
*Sungkyunkwan University (SKKU), Engineering Mathematics 2* *07/2023-08/2023*

- Worked as a teaching assistant during the international summer semester.
- Prepared and organized class materials, including exams.

## TECHNICAL SKILLS

GPU Profiling (Nsight Systems, Nsight Compute), Circuit (Cadence Virtuoso, SoC, Verilog), Programming (C, Python, CUDA, MATLAB), Quantum Computing (Qiskit), Data Analysis (NumPy, Pandas, Matplotlib), Scientific Writing (LaTeX)

## CERTIFICATIONS & TEST SCORES

Qiskit Global Summer School 2025 Quantum Excellence (IBM Quantum)
CS50's Introduction to Artificial Intelligence with Python (Harvard University)
CS50's Introduction to Cybersecurity (Harvard University)
TOEFL iBT – Score: 108