

# MYEONGJIN SHIN

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## EDUCATION

### Korea Advanced Institute of Science and Technology (KAIST)

B.S. in Computing Science; double major in Mathematical Sciences; GPA: 4.0/4.3

Daejeon, Korea

Mar. 2021 – Aug. 2027

- KAIST enrollment period includes a two-year academic leave for mandatory military service in the Republic of Korea.

### Gyeonggi Science High School for the Gifted

Computer Science

Suwon, Korea

Mar. 2018 – Feb. 2021

## RESEARCH AND WORK EXPERIENCE

### Caltech SURF Program

Undergraduate Research Fellow; advisor: Prof. Yu Tong, Prof. John Preskill

California, Caltech

May. 2026 – Present

- Research on practical Hamiltonian learning with static single qubit fields.
- Research on certifying Hamiltonians in the Heisenberg limit with single qubit gates and measurements

### KAIST Physics Quantum Information Theory Group

Undergraduate Research Assistant; advisor: Prof. Changhun Oh

Daejeon, Korea

Dec. 2025 – Present

- Research on Hamiltonian learning, bosonic and fermionic systems.

### Research Institute of Mathematics, Seoul National University

Undergraduate Research Assistant; advisor: Dr. Kabgyun Jeong

Seoul, Korea

Feb. 2022 – Present

- Research on quantum entropies, variational quantum algorithms, quantum property testing, quantum singular value transformation.

### KRAFTON

Research Internship

Seoul, Korea

Jul. 2023 – Aug. 2023

- Researched AI optimization methods and image processing.

## PUBLICATIONS

\* Equal contribution. <sup>( $\alpha-\beta$ )</sup> Alphabetical order, following theoretical computer science convention. † First author.

### PREPRINTS

[8] **Heisenberg-limited Hamiltonian learning without short-time control**

Myeongjin Shin<sup>†</sup>, Junseo Lee, Changhun Oh. **AQIS long talk** (2026).

[7] **Near optimal quantum algorithm for estimating Shannon entropy**

Myeongjin Shin<sup>†</sup>, Kabgyun Jeong. arXiv:2509.07452 (2026);

### CONFERENCES

[6] **Certifying and learning local quantum Hamiltonians**

Andreas Bluhm, Matthias C. Caro, Francisco Escudero Gutiérrez, Junseo Lee, Aadil Oufkir, Cambyse Rouzé, **Myeongjin Shin**<sup>( $\alpha-\beta$ )</sup>.

**TQC contributed talk** (2026).

*Note:* This work subsumes a previous note, [Optimal certification of constant local Hamiltonians](#), arXiv:2512.09778.

### JOURNAL ARTICLES

[5] **Bounding quantum uncommon information with quantum neural estimators**

Donghwa Ji, Junseo Lee, **Myeongjin Shin**, IlKwon Sohn, Kabgyun Jeong. *Quantum Science and Technology* **11**(1), 015001 (2025).

[4] **Mutual information maximizing quantum generative adversarial networks**

Mingyu Lee, **Myeongjin Shin**, Junseo Lee, Kabgyun Jeong. *Scientific Reports* **15**(1), 32835 (2025).

[3] **Resource-efficient algorithm for estimating the trace of quantum state powers**

**Myeongjin Shin**<sup>\*</sup>, Junseo Lee<sup>\*</sup>, Seungwoo Lee, Kabgyun Jeong. *Quantum* **9**, 1832 (2025).

[2] **Disentangling quantum neural networks for unified estimation of quantum entropies and distance measures**

**Myeongjin Shin**<sup>\*</sup>, Seungwoo Lee<sup>\*</sup>, Junseo Lee<sup>\*</sup>, Mingyu Lee, Donghwa Ji, Hyeonjun Yeo, Kabgyun Jeong. *Physical Review A* **110**(6), 062418 (2024).

[1] **Estimating quantum mutual information through a quantum neural network**

**Myeongjin Shin**<sup>†</sup>, Junseo Lee, Kabgyun Jeong. *Quantum Information Processing* **23**(2), 1–16 (2024).

## RESEARCH TALKS

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### Heisenberg-limited Hamiltonian learning without short-time control

[Contributed] Asian quantum information science conference (AQIS 2026)

Aug. 2026

[Invited] TUHH group seminar

July. 2026

[Invited] KAIST Physics QIT Lab Seminar

May. 2026

### Certifying and learning local quantum Hamiltonians

[Contributed] Theory of Quantum Computation, Communication and Cryptography Conference (TQC 2026)

Sep. 2026

[Invited] Quantum meets ([Youtube link](#))

June. 2026

### Optimal certification of constant local Hamiltonians

[Invited] University of Edinburgh Quantum Software Lab

Mar. 2026

[Invited] KAIST Physics QIT Lab Seminar

Dec. 2025

### Near optimal quantum algorithm for estimating Shannon entropy

[Invited] Team QST Summer Workshop

Aug. 2025

### Resource-efficient algorithm for estimating the trace of quantum state powers

[Contributed] Annual Meeting of Korean Mathematical Society

Oct. 2024

[Poster] Annual Conference on Quantum Information Processing (QIP 2025)

Feb. 2025

### Disentanglement provides a unified estimation for quantum entropies and distance measures

[Contributed] Korean Physical Society Spring Meeting

Apr. 2024

[Poster] Annual Conference on Quantum Information Processing (QIP 2024)

Jan. 2024

### Mutual information maximizing quantum generative adversarial networks

[Invited] North Carolina State University Triangle Quantum Computing Seminar

Nov. 2023

[Poster] Annual Conference on Quantum Information Processing (QIP 2024)

Jan. 2024

### Estimating quantum mutual information through a quantum neural network

[Invited] National Institute of Science Education and Research Bhubaneswar, India

Aug. 2023

[Poster] Asian Quantum Information Science Conference (AQIS 2023)

Aug. 2023

[Poster] Conference on the Theory of Quantum Computation (TQC 2023)

Jul. 2023

## RESEARCH INTERESTS

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- Quantum Learning Theory
- Quantum Property Testing
- Quantum Entropies and Distance Measures
- Hamiltonian and Lindbladian Learning
- Quantum Algorithms; QSVT and DQI
- Quantum Error Correction

## TEACHING EXPERIENCE

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### Quantum Algorithms

Lectured on quantum decoded interferometry (DQI).

Winter 2025

### Quantum Sensing and Hamiltonian Learning Study Group

Organized a study group on quantum computational sensing and Hamiltonian learning with real-time evolution.

Fall 2025

### Quantum Learning and Complexity Theory

Lectured on random unitaries, classical shadows, quantum property testing, QSVT, and QAE.

Summer 2025

## SELECTED HONORS AND AWARDS

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### KAIST Presidential Fellowship (KPF)

Mar. 2021 – Present

### KRAFTON AI Fellowship

Jul. 2023 – Aug. 2023

2024 Quantum Hackathon Korea – 1st place; Ministry of Science and ICT Prize

Jun. 2024

### WorldQuant Brain Research Consultant

Sep. 2023

2023 Quantum Hackathon Korea – 3rd place; IonQ Special Prize

Jun. 2023

### QHack Certificate of Achievement (Advanced)

Feb. 2023

### Xanadu QHack Coding Challenges

Feb. 2023

### Best Paper Award, Gyeonggi Science High School

Feb. 2021

## PROFESSIONAL ACTIVITIES

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### Journal Reviewer

Quantum Information Processing; Quantum Machine Intelligence; npj Quantum Information

## SKILLS AND QUALIFICATIONS

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**Programming** C/C++, Python; Qiskit, PennyLane, PyTorch, TensorFlow, Java, JavaScript, Rust, React, Processing  
**Problem Solving** Codeforces rating 1894 (Expert), max rating 1962 (Candidate Master): [godthinkun](#)  
**Languages** Korean (native); English (fluent, TOEFL iBT 108); German and Spanish (basic)

Last updated: May, 2026