Myeongjin Shin

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EDUCATION

Korea Advanced Institute of Science and Technology — Daejeon, Korea
BS in Computing Science, Double major in Mathematical Sciences (4.0/4.3) — *Mar. 2021 – Aug. 2027*

Gyeonggi Science High School For The Gifted — Suwon, Korea
Computer Science — *Mar. 2018 – Feb. 2021*

RESEARCH & WORK EXPERIENCE

Research Institute of Mathematics, Seoul National University. — Seoul, Korea
Undergraduate research assistant (advisor: Dr. Kabgyun Jeong) — *Feb. 2022 – Present*

- Keyword: Quantum entropies, Variational quantum algorithms, Quantum property testing, Quantum singular value transformation, Hamiltonian certification

KAIST Physics Quantum Information Theory Group. — Daejeon, Korea
Undergraduate research assistant (advisor: Prof. Changhun Oh) — *Dec. 2025 – Present*

- Keyword: Hamiltonian learning, Decoded quantum interferometry

KRAFTON — Seoul, Korea
Internship — *Jul. 2023 – Aug. 2023*

- Researched AI optimization methods and image processing

PUBLICATIONS

* Equal contribution, $^{(\alpha-\beta)}$ Alphabetical order (theoretical computer science convention), † first author.

Preprints

Myeongjin Shin†, Junseo Lee, Changhun Oh, "Hamiltonian learning with long time evolution", scheduled (2026)

Myeongjin Shin†, Kabgyun Jeong, "Near optimal quantum algorithm for estimating Shannon entropy", arxiv: 2509.07452 (2026, BIID contributed talk submitted)

Conferences

Andreas Bluhm, Matthias C. Caro, Francisco Escudero Gutiérrez, Junseo Lee, Aadil Oufkir, Cambyse Rouzé, **Myeongjin Shin**$^{(\alpha-\beta)}$, "Certifying and learning local quantum Hamiltonians", **TQC contributed talk** (2026)
Note: This work subsumes a previous note "Optimal certification of constant local Hamiltonians", arxiv: 2512.09778.

Journal Articles

Donghwa Ji, Junseo Lee, **Myeongjin Shin**, IlKwon Sohn, Kabgyun Jeong, "Bounding quantum uncommon information with quantum neural estimators", Quantum Science and Technology 11 (1), 015001 (2025)

Mingyu Lee, **Myeongjin Shin**, Junseo Lee, Kabgyun Jeong, "Mutual information maximizing quantum generative adversarial networks", Scientific Reports 15 (1), 32835 (2025)

Myeongjin Shin*, Junseo Lee*, Seungwoo Lee, Kabgyun Jeong, "Resource-efficient algorithm for estimating the trace of quantum state powers", **Quantum** 9, 1832 (2025)

Myeongjin Shin*, Seungwoo Lee*, Junseo Lee*, Mingyu Lee, Donghwa Ji, Hyeonjun Yeo, Kabgyun Jeong, "Disentangling quantum neural networks for unified estimation of quantum entropies and distance measures", Physical Review A 110 (6), 062418 (2024)

Myeongjin Shin†, Junseo Lee, Kabgyun Jeong, "Estimating quantum mutual information through a quantum neural network", Quantum Information Processing 23 (2), 1-16 (2024)

RESEARCH TALKS

Certifying and learning local quantum Hamiltonians

[Contributed] Theory of Quantum Computation, Communication and Cryptography Conference (TQC 2026) (Sep. 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 (KMS) (Oct. 2024)

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

Disentanglement provide 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)

PROFESSIONAL ACTIVITIES

Journal Reviewer
Quantum Information Processing Journal (QINP), Quantum Machine Intelligence (QMI)

TEACHING EXPERIENCE

Quantum Algorithms Winter 2025
Lectured about quantum decoded interferometry (DQI)

Quantum Sensing and Hamiltonian Learning Study Group Fall 2025
Organized a study about quantum computational sensing and Hamiltonian learning with real time evolution

Quantum Learning and Complexity Theory Summer 2025
Lectured about random unitaries, classical shadows, quantum property testing, QSVT, QAE, etc

HONORS

KRAFTON AI Fellowship Jul. 2023 – Aug. 2023

KAIST Presidential Fellowship (KPF) Mar. 2021 – present

AWARDS & ACHIEVEMENTS

2024 Quantum Hackathon Korea Jun. 2024
1st place. Ministry of Science and ICT prize.

WorldQuant Brain Research Consultant Sep. 2023

2023 Quantum Hackathon Korea Jun. 2023
3st place. IonQ special prize.

KRAFTON AI Fellowship Jul. 2023

QHack Certificate of Achievement (Advanced) Feb. 2023

Xanadu QHack Coding Challenges Feb. 2023

Best Paper Award from Gyeonggi Science High School Feb. 2021

SKILLS AND QUALIFICATIONS

Programming languages & Tools

Advanced skills: C/C++, Python

Basic skills: Qiskit, Pennylane, Pytorch, Tensorflow, JAVA, Javascript, Rust, React, Processing

Algorithms and problem solving skills

Codeforces | rating 1894 (Expert), max rating 1962 (Candidate master), godthinkun

Languages

Native | Korean

Fluent | English (TOEFL iBT 108)

Basic | German, Spanish

Interests

- **Quantum Learning Theory**: Hamiltonian and Lindbladian learning, testing and certification, Gibbs state learning, Agnostic tomography, Quantum memory-sample complexity tradeoff.
- **Quantum Algorithms**: Applications of quantum singular value transformation (QSVT), Decoded quantum interferometry (DQI).
- **Quantum Property Testing**: (Optimal) estimation of quantum entropies and distance measures, Estimation of nonlinear properties of the quantum state (such as trace of quantum state powers).
- Quantum Error Correction
- Machine Learning and it's Applications.

Last updated: Mar, 2026.