

JAEHOON HAHM

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Email: jh141@illinois.edu Github: github.com/jaehoon-hahm Homepage: jaehoon-hahm.github.io

RESEARCH INTEREST

ML + Quantum Many-body Physics, ML + Material Science, Geometric Generative Models, Diffusion/Flow/Energy-based models, Neural Quantum States.

EDUCATION

University of Illinois Urbana-Champaign (UIUC)

Ph.D. Physics

2024.08 – Current

Advisor: Bryan K. Clark

Research: Machine Learning for Quantum Many-body Physics, ML + Material Science, Computational Condensed Matter

Graduate School of Data Science, Seoul National University (SNU)

M.S. Data Science

2022.03 – 2024.02

- Thesis: *Isometric Representation Learning for Disentangled Latent Space of Diffusion Models*

- Advisor: Joonseok Lee

Seoul National University (SNU)

B.S. Physics, minor in Mathematics

2016.03 – 2022.02

- Thesis: *Improvement in Variational Quantum Algorithms by Measurement Simplification*

- Advisor: Young June Park

- Mandatory Military Service: Republic of Korea Army, 2019.07 – 2021.02

Seoul Science High School

Graduated with Distinction

2013.03 – 2016.02

- 1 year early admission to a science gifted high school

PUBLICATIONS

[P3] “Equivariant Latent Alignment via Flow Matching under Group Symmetries”
Sunghyun Kim*, [Jaehoon Hahm](#)*, Jeongwoo Shin, Joonseok Lee[†]
Under Review at ICLR 2025

[P2] “ShadowFM: Geometric Approaches for Learning Quantum Many-body States with Flow Matching on Classical Shadows”
[Jaehoon Hahm](#), Bryan Clark[†]
Under Review at ICLR 2025

[C3] “SummDiff: Generative Modeling of Video Summarization with Diffusion”
Kwanseok Kim*, [Jaehoon Hahm](#)*, Sumin Kim, Jinhwan Sul, Byunghak Kim, Joonseok Lee[†]
International Conference on Computer Vision (ICCV) 2025, Highlight (263/11,239 = 2.3%)

[C2] “Generative Modeling of Quantum Distribution with Functional Flow Matching”
[Jaehoon Hahm](#)*, Tak Hur*, Joonseok Lee, Daniel K. Park[†]
Quantum Techniques in Machine Learning (QTML) 2024

[C1] “Isometric Representation Learning for Disentangled Latent Space of Diffusion Models”

Jaehoon Hahm*, Junho Lee*, Sunghyun Kim, Joonseok Lee†
International Conference on Machine Learning (ICML) 2024

[P1] “Improvement in Variational Quantum Algorithms by Measurement Simplification”

Jaehoon Hahm, Hayeon Kim, Young June Park
arXiv:2312.06176

WORK EXPERIENCE	Undergraduate Research Assistant	2018.07 – 2019.04, 2021.02 – 2021.12
	Advisor: Young June Park, <i>Samsung Beyond Limit</i> project	ECE, SNU
	- Proposed a “Measurement Simplification” pre-processing method that accelerates variational quantum circuit computation.	
	- Experiments of Quantum KNN on IBM Qiskit quantum computers.	
	Undergraduate Research Assistant	2021.02 – 2021.12
	Advisor: Taehyun Kim	CSE, SNU
	- Measured gate fidelities of the group’s trapped-ion quantum computer using randomized benchmarking protocol, by self-developed control framework based on IBM Qiskit.	
	Undergraduate Research Assistant	2021.07 – 2021.12
	Advisor: Hyunyoung Choi	Physics, SNU
	- Performed diamond NV center control experiments: Rabi oscillation, spin echo, and dynamical decoupling.	
	Sergeant, Republic of Korea Army	2019.07 – 2021.02
	<i>Chemical, Biological, Radiological, and Nuclear Reconnaissance, 5th Infantry Division</i>	
	- Discharged after 19 months of mandatory military service at Yeoncheon, one of the front borderlines of Korea.	
	Korea Patent	
	SummDiff: Generative Modeling of Video Summarization with Diffusion	2025
TEACHING EXPERIENCE	TA, UIUC	
	PHYS0212: University Physics, Electricity & Magnetism	2025
	PHYS435: Electromagnetic Fields I	2024
	TA, SNU	
	M2480.001100: Principles & Applications of Data Science	2023
LANGUAGES	Programming: Python, C, C++, Java, MATLAB, Mathematica	
	Frameworks: PyTorch, JAX, TensorFlow, NumPy, Pandas	
	Quantum: IBM Qiskit, Google Cirq, PennyLane, TensorFlow Quantum	
	Natural Languages: English (Professional), Korean (Native)	
REFERENCES	Bryan K. Clark	2024.08 - Current
	Ph.D. Advisor (UIUC)	bkclark@illinois.edu

Rainer Engelken
Collaborator (UIUC)

2025.09 - Current
engelken@illinois.edu

Ge Liu
Collaborator (UIUC)

2025.06 - Current
gelu@illinois.edu

Joonseok Lee
M.S. Advisor (SNU)

2022.03 - 2024.02
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