

Yong Kwon

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Master of Science

PKNU, Busan, Republic of Korea

Research interests

Quantum computing (Linear optical quantum computing, Quantum verification and validation)

Quantum information (entanglement entropy, concurrence)

Education

- Feb. 2024 **M.S. in Physics**
Pukyong National University – Busan
Advisor: Prof. Byung-Soo Choi (2022.06 –) and Prof. Seung Ki Baek (– 2022.05)
(2022.09 – and – 2022.08 as an official document)
Thesis title: “Two Approaches of Quantum Information and Quantum Computing : Information Entropy and Computer Systems”
- Feb. 2022 **B.S. in Physics**
Pukyong National University – Busan
Advisor: Prof. Seung Ki Baek and Prof. Jaegon Um as a co-advisor (2020.07 –)

Publications

- 2024 ***Quantum Circuit Mapping for Universal and Scalable Computing in MZI-based Integrated Photonics***
Kwon, Baldazzi, Pavesi, and Choi
Submitted in Progress [arXiv](#)
- Oct. 2023 **“A Software Platform for Programmable Linear Optical Quantum Computer”**
Kwon and Choi
IEEE Access [doi](#)
- Sep. 2022 **“Correlation between concurrence and mutual information”**
Kwon, Baek, and Um
Journal of Statistical Mechanics: Theory and Experiment [doi](#)

Research experience

- Jun. 2022 – **Quantum Computational Science Lab – [QCS Labsite](#)**
EPIQUS Project
Mentor: Prof. Byung-Soo Choi (PKNU)
 - Project Overview: [main page](#) / [CORDIS information](#)
 - Build up the optimized software for epiqus project
- Jun. 2020 – May 2022 **Statistical Physics Laboratory – [Statphys Labsite](#)**
Entanglement vs mutual information on two qubit system
Mentors: Prof. Jaegon Um (POSTECH), Prof. Seung Ki Baek (PKNU)
 - Investigate on two spin-1/2 particles
 - Find correlated information entropy on classical definition and quantum definition
 - Compare two entropy values using ‘Concurrence’

Fall 2020

Others

Quantum-like game development

Mentor: Prof. Jae-yeol Hwang (PKNU) (only for class guidance)

- The word ‘Quantum-like game’ means a game made by applying the phenomenon to introduce to those who are not familiar with quantum physics.
- This project worked during the one of undergraduate classes, ‘Capstone Design I’
- My contributions: project idea suggestion, introducing concept of quantum-like games, GUI development
- Find more detailed information following Github team [repository](#).

Teaching experience

Fall 2022

TA, Physical Experiment II (PKNU)

A physical experiment class in general physics topics for freshman students.

Spring 2022

TA, Physical Experiment I (PKNU)

A physical experiment class in general physics topics for freshman students.

Talks and posters

Jul. 2023

[T] A Universal and programmable software platform for linear optical quantum computing
International Workshop on Quantum Compilation 2023 [link](#)

Apr. 2022

[T] Correlation between mutual information and concurrence
KPS Spring Meeting 2022 [link](#)

Oct. 2021

[P] Correlation between mutual information and concurrence
KPS Fall Meeting 2021

Aug. 2021

[P] Entanglement vs. mutual information
Roles of heterogeneity in non-equilibrium collective dynamics (RHINO) 2021 [link](#)

Technical skills

Programming languages

Python, C (a little bit), \LaTeX , Markdown

Software

Linux (usually Ubuntu), Git, Mathematica (a little bit)

Languages

Korean (mother language), English (intermediate level)

Activities

Jan. 2022

The 19th KIAS-APCTP winter school on statistical physics

Jan. 2021

The 18th KIAS-APCTP winter school on statistical physics

Apr. 2018 – Dec.
2019

Military service

- Combat engineer, 2nd Armored Brigade, Republic of Korea Army

Jul. 2017

PKNU-ISS (International Summer School) Program

- Officially certified program by PKNU
- Attended seasonal classes with abroad students who were enrolled to my university
- To this program, my english skill has improved and felt their cultural difference

Traveling abroad experiences

- For visiting & conference attendance: Italy , Belgium and France (2023)
- For a trip: Vietnam (2016) , Taiwan (2016) , Japan (2018) , Italy (2020) and the Philippines (2023)