Kunwoo Park

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Research Interests

Optical computing; disordered photonics; topological photonics; open quantum systems.

Education

Integrated M.S./Ph.D., Department of Electrical and Computer Engineering — 2024.09 – present
Seoul National University Advisor: Sunkyu Yu (Expected: 2029.08)

B.S., Department of Electrical and Computer Engineering — 2018.03 – 2024.08
Seoul National University

Military Service, Republic of Korea Army — 2020.12 – 2022.06

Academic Positions

- Placeholder.

Research Experience

- **Optical Computing.** Placeholder.
- **Disordered Photonics.** Placeholder.
- **Topological Photonics.** Placeholder.
- **Open Quantum Systems.** Placeholder.

Publications

Preprints

1. Gitae Lee, Seungmok Youn, Ikbeom Lee, **Kunwoo Park**, Duwhan Hwang, Xianji Piao*, Namkyoo Park* and Sunkyu Yu*. Non-Hermitian stealthy hyperuniformity. arXiv:2602.09458.
2. **Kunwoo Park**, Ikbeom Lee, Seungmok Youn, Gitae Lee, Namkyoo Park* and Sunkyu Yu*. Hypergraph modelling of wave scattering to speed-up material design. arXiv:2507.15329.

Journal Articles

1. Seungmok Youn, **Kunwoo Park**, Ikbeom Lee, Gitae Lee, Namkyoo Park* and Sunkyu Yu*. Phase-sensitive engineering of optical disordered materials using heterogeneous networks. *Advanced Optical Materials* 14, e03499 (2026). doi:10.1002/adom.202503499.
2. Kyuho Kim†, **Kunwoo Park**†, Hyungchul Park, Sunkyu Yu, Namkyoo Park* and Xianji Piao*. Programmable photonic unitary circuits for light computing. *Nanophotonics* 14, 1429 (2025). doi:10.1515/nanoph-2024-0602.

Conference Proceedings

1. Ikbeom Lee, **Kunwoo Park**, Seungmok Youn and Sunkyu Yu*. Inverse design of microstructures of non-Hermitian scattering systems. SPIE Optics + Photonics 2025, 13578-59, San Diego, California, USA, 6 August 2025. doi:10.1117/12.3062322.
2. **Kunwoo Park**, Ikbeom Lee, Seungmok Youn and Sunkyu Yu*. Modularization of light scattering for photonic computing applications. SPIE Optics + Photonics 2025, 13581-25, San Diego, California, USA, 5 August 2025. doi:10.1117/12.3062195.
3. Ikbeom Lee, **Kunwoo Park** and Sunkyu Yu*. Design of wave scattering from gain and loss disordered materials. CLEO-PacificRim (CLEO-PR) 2024, Mo2J-4, Incheon, Republic of Korea, 5 August 2024. doi:10.1109/CLEO-PR60912.2024.10676414.
4. **Kunwoo Park**, Ikbeom Lee and Sunkyu Yu*. Inverse design method of hyperuniform materials using system factorization. CLEO-PacificRim (CLEO-PR) 2024, Mo2J-2, Incheon, Republic of Korea, 5 August 2024.

doi:10.1109/CLEO-PR60912.2024.10676648.

Patents

1. Nonlinear unitary optical device. Sunkyu Yu, Namkyoo Park, Xianji Piao and **Kunwoo Park**. KR 10-2859166; US application 19/048,370; EU application 25156862.2.

Grants and Fellowships

Graduate Research Encouragement Grant ( ) 2025 – present
Principal Investigator

Teaching

Application of Quantum Mechanics (Graduate), Teaching Assistant Spring 2025
Seoul National University

Topics in Electro-physics (Graduate), Teaching Assistant Spring 2025
Seoul National University

Technical Skills

- **Theory and modeling:** Placeholder.
- **Computation:** Placeholder.
- **Experimentation:** Placeholder.
- **Software:** Placeholder.

Professional Service

- Placeholder.

References

Available upon request.

{† Co-first authors. * Corresponding authors.}