

DONGJIN SEO

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EDUCATION

- [3] **Yale University** Aug 2024 -
Ph.D. in Applied Physics Connecticut, USA
- [2] **Korea Advanced Institute of Science and Technology (KAIST)** Feb 2019 - Feb 2021
M.S. in Electrical Engineering (Academic Advisor: Prof. [Min Seok Jang](#)) [\[thesis\]](#) Daejeon, South Korea
- [1] **Korea Advanced Institute of Science and Technology (KAIST)** Feb 2011 - Feb 2019
B.S. in Electrical Engineering Daejeon, South Korea
- On Leave Aug 2014 - May 2016 for National Military Service

PUBLICATION

- [5] ASOptimizerTM: optimizing antisense oligonucleotides through deep learning for IDO1 gene regulation [\[paper\]](#) 2024
G Hwang[†], M Gwon[†], D Seo, DH Kim, K Lee, E kim, M Kang*, J Ryu*. *Molecular Therapy Nucleic Acids*
- [4] Sample-efficient inverse design of freeform nanophotonic devices with physics-informed reinforcement learning [\[paper\]](#) 2024
C Park[†], S Kim[†], W Jeong[†], J Park, D Seo, Y Kim, C Park, CY Park*, MS Jang*. *Nanophotonics*
- [3] Adjoint Method in Machine Learning: A Pathway to Efficient Inverse Design of Photonic Devices [\[paper\]](#) 2024
C Kang[†], D Seo[†], S V Boriskina, H Chung*. *Materials & Design*
- [2] Structural Optimization of a One-Dimensional Freeform Metagrating Deflector via Deep Reinforcement Learning [\[paper\]](#) [\[source code\]](#) [\[press\]](#) 2022
selected as the [Front Cover](#) of 2022 Feb. Issue
D Seo[†], DW Nam[†], J Park, CY Park*, MS Jang*. *ACS Photonics*
- [1] Inverse design of organic light-emitting diode structure based on deep neural networks [\[paper\]](#) 2021
S Kim, JM Shin, J Lee, C Park, S Lee, J Park, D Seo, S Park, CY Park, MS Jang*. *Nanophotonics*

PUBLICATION UNDER REVIEW

- [1] Physics-guided Optimization of Photonic Structures using Denoising Diffusion Probabilistic Models
D Seo[†], S Um[†], S Lee, J Ye, H Chung.

CONFERENCE

- [3] [poster] Physics-guided Diffusion Models for Inverse Design Aug 2024
D Seo, S Um, J Ye, H Chung. *CLEO-PR 2024*
- [2] [talk] Adjoint Method for Data Augmentation of Photonic Structures Aug 2023
D Seo, C Kang, H Chung. *Optica Imaging Congress* [\[proceeding\]](#)
- [1] [talk] Deep reinforcement learning enables freeform structure optimization of 1D metagrating deflector Oct 2022
D Seo, DW Nam, J Park, CY Park, MS Jang. *SPIE Optical Engineering + Applications* [\[video\]](#)

PATENT

[8] Device and method for placing classroom placements using student personality and grade data and machine learning technology

Korean Patent / Registration No. 10-2671422-0000 / Registration Date 2024.05.28 [\[patent\]](#)

Inventors: S Choi, [D Seo](#), T Hwang.

[7] Method for optimizing classroom structure to achieve maximum learning efficiency utilizing policy-based reinforcement learning

Korean Patent / Registration No. 10-2671423-0000 / Registration Date 2024.05.28 [\[patent\]](#)

Inventors: [D Seo](#), T Hwang.

[6] Devices, methods and programs for sampling a group of respondents based on artificial intelligence

Korean Patent / Registration No. 10-2663479-0000 / Registration Date 2024.04.30 [\[patent\]](#)

Inventors: Y Kwon, S Choi, [D Seo](#), T Hwang.

[5] Method and System for Determining Psychological State based on Large Language Model

Korean Patent / Registration No. 10-2624653-0000 / Registration Date 2024.01.09 [\[patent\]](#)

Inventors: S Choi, [D Seo](#), T Hwang.

[4] Server and Method for Generating Personality Test using Query Response Network based on Language Model

Korean Patent / Registration No. 10-2591769-0000 / Registration Date 2023.10.17 [\[patent\]](#)

Inventors: Y Kwon, S Choi, [D Seo](#), T Hwang.

[3] Method for Sampling Process of Personality Test Using Question and Answer Network Representing Group of Respondents Based on BERT

Korean Patent / Registration No. 10-2583818-0000 / Registration Date 2023.09.22 [\[patent\]](#)

Inventors: Y Kwon, S Choi, [D Seo](#), T Hwang.

[2] Method and System for Designing Optimal Sequence of RNA Therapeutics

Korean Patent / Registration No. 10-2546977-0000 / Registration Date 2023.06.20 [\[patent\]](#)

Inventors: [D Seo](#), M Kang, G Hwang, K Lee.

[1] Method and System for Designing RNA Therapeutics

Korean Patent / Registration No. 10-2499895-0000 / Registration Date 2023.02.09 [\[patent\]](#)

Inventors: [D Seo](#), M Kang, G Hwang, K Lee.

HONORS AND AWARDS

[6] 2nd Place of ‘2023 Corning AI Challenge’ [\[website\]](#) Dec 2023

[5] 6th Place of ‘AI Grand Challenge: Policy Assistance AI’ Second Round [\[press\]](#) Dec 2023

- hosted by *the Ministry of Science and ICT of South Korea*

- Position: Team Leader

- Subject: Understanding and creating tables and figures, writing reports with a clear hierarchy using AI

[4] 3rd Place of ‘AI Grand Challenge: Policy Assistance AI’ [\[website\]](#) [\[press\]](#) Jul 2023

- hosted by *the Ministry of Science and ICT of South Korea*

- Position: Team Leader

- Subject: Developing an AI for the interpretation of governmental documents using NLP and CV techniques

- [3] 2022 Talent Award of Korea [\[website\]](#) [\[press\]](#) Dec 2022
- bestowed by *the Deputy Prime Minister and Minister of Education of South Korea*
- [2] Best Paper Award (Honorable Mention) [\[website\]](#) Sep 2017
- bestowed by *the School of Humanities & Social Science, KAIST*
- [1] Exemplary Soldier Award [\[link\]](#) May 2016
- bestowed by *Senior Superintendent of the Guard of Government Complex Daejeon*
(one person per platoon, Top 5%)