

Seung-Woo Nam

Curriculum Vitae

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Education

09/2019 – Present **Ph.D.** Electrical and Computer Engineering, Seoul National University
Seoul, Korea. *Advisor: ByoungHo Lee, Yoonchan Jeong*

03/2015 – 08/2019 **B.S.** Electrical and Computer Engineering, Seoul National University
Seoul, Korea

03/2012 – 02/2015 Gyeonggi Science High School for the Gifted

Work Experience

06/2023 – 12/2023 **Research Scientist Intern**, Meta Reality Labs, Washington, USA

Publications

First Author * *Denotes equal contribution*

- [7] S. Lee*, **S.-W. Nam***, K. Rio, R. Landig, H.-H. Cheng, L. Lu, and B. Silverstein, "Perceptual Evaluation of Steered Retinal Projection," *SIGGRAPH 2024 (Accepted)*
- [6] D. Kim*, **S.-W. Nam***, S. Choi*, J.-M. Seo, G. Wetzstein, and Y. Jeong, "Holographic Parallax Improves 3D Perceptual Realism," *SIGGRAPH 2024 (Accepted)*
- [5] **S.-W. Nam***, Y. Kim*, D. Kim, and Y. Jeong, "Depolarized Holography with Polarization-multiplexing Metasurface," *ACM Transactions on Graphics (SIGGRAPH ASIA 2023)*.
- [4] D. Kim*, **S.-W. Nam***, B. Lee, J.-M. Seo, and B. Lee, "Accommodative holography: improving accommodation response for perceptually realistic holographic displays," *ACM Transactions on Graphics (SIGGRAPH 2022)*
- [3] **S.-W. Nam**, D. Kim, and B. Lee, "Accelerating a spatially varying aberration correction of holographic displays with low-rank approximation," *Optics Letters, 2022 (Editor's pick)*
- [2] D. Kim*, **S.-W. Nam***, K. Bang, B. Lee, S. Lee, Y. Jeong, J.-M. Seo, and B. Lee, "Vision-correcting holographic display: evaluation of aberration correcting hologram," *Biomedical Optics Express*, 2021
- [1] **S.-W. Nam**, S. Moon, B. Lee, D. Kim, S. Lee, C.-K. Lee, and B. Lee, "Aberration-corrected full-color holographic augmented reality near-eye display using a Pancharatnam-Berry phase lens," *Optics Express*, 2020.

Co – Author

- [8] S. Lee, **S.-W. Nam**, J. Lee, Y. Jeong, and B. Lee, "HoloSR: deep learning-based super-resolution for real-time high-resolution computer-generated holograms," *Optics Express*, 2024.
- [7] D. Lee, K. Bang, **S.-W. Nam**, B. Lee, D. Kim, and B. Lee, "Expanding energy envelope in holographic display via mutually coherent multi-directional illumination," *Scientific Reports*, 2022.
- [6] D. Yoo, **S.-W. Nam**, Y. Jo, S. Moon, C. -K. Lee, and B. Lee, "Learning-based compensation

of spatially varying aberrations for holographic display [Invited]," Journal of the Optical Society of America A, 2022.

- [5] D. Yoo, Y. Jo, **S.-W. Nam**, C. Chen, and B. Lee, "Optimization of computer-generated holograms featuring phase randomness control," Optics Letters, 2021.
- [4] S. Lee*, D. Kim*, **S.-W. Nam**, B. Lee, J. Cho, and B. Lee, "Light source optimization for partially coherent holographic displays with consideration of speckle contrast, resolution, and depth of field," Scientific Reports, 2020.
- [3] S. Lee, D. Kim, **S.-W. Nam**, and B. Lee, "Speckle reduced holographic displays using tomographic synthesis," Optics Letters, 2020
- [2] S. Moon, **S.-W. Nam**, Y. Jeong, C.-K. Lee, H.-S. Lee, and B. Lee, "Compact augmented reality combiner using Pancharatnam-Berry phase lens," IEEE Photonics Technology Letters, 2020.
- [1] S. Moon, C.-K. Lee, **S.-W. Nam**, C. Jang, G.-Y. Lee, W. Seo, G. Sung, H.-S. Lee, and B. Lee, "Augmented reality near-eye display using Pancharatnam-Berry phase lenses," Scientific Reports, 2019.

International Conferences

- [7] **S.-W. Nam**, D. Kim, and B. Lee, "Evaluation of Low-Rank Approximation for Spatially-Varying Aberration Correction in Holographic Displays," in Digital Holography and 3-D Imaging 2022, Technical Digest Series (Optica Publishing Group, 2022), paper W2A.12.
- [6] D. Kim, **S.-W. Nam**, B. Lee and B. Lee, "Wide field of view holographic tiled display through axially overlapped holographic projection" Ultra-High-Definition Imaging Systems V, SPIE Photonics West 2022, Virtual Conference, paper 120250D, March. 2022.
- [5] B. Lee, **S.-W. Nam**, and D. Kim, "Aberration correction in holographic displays," Ultra-High-Definition Imaging Systems V, SPIE Photonics West 2022, Virtual Conference, paper 120250A, March. 2022. (Invited paper)
- [4] D. Kim, **S.-W. Nam**, and B. Lee, "Analysis in wavefront propagation based on ray tracing for acquisition of aberration-corrected hologram," SPIE/COS Photonics Asia Digital Forum 2020, Virtual Conference, paper 11549-60, Oct. 2020.
- [3] **S.-W. Nam**, D. Kim, K. Bang, and B. Lee, "Aberration compensation of holographic augmented reality display with optical path length based ray tracing method," The 20th International Meeting on Information Display (IMID 2020), Virtual Conference, paper 05-09-1277, Aug. 2020. (**Best Poster Paper Award**)
- [2] **S.-W. Nam**, S. Moon, C.-K. Lee, H.-S. Lee, and B. Lee, "Holographic augmented reality near-eye display using Pancharatnam-Berry phase lens," The 14th Pacific Rim Conference on Lasers and Electro-Optics (CLEO PR 2020), Virtual Conference, 2020.
- [1] D. Kim, **S.-W. Nam**, K. Bang, and B. Lee, "Holographic near-to-eye display for vision-correcting application" 2020 SID Display week, Virtual Conference, paper P.81. 2020

Honors and Awards

2023	Silver prize, Samsung Display Industry-University Cooperation Paper Award 2023
2020	Special awards in OEQELAB
2020	Best Poster Paper Awards, The 20th International Meeting on Information Display (IMID 2020)
2020 - 2024	Korea Foundation for Advanced Studies (KFAS) Graduate Study Scholarship
2015 - 2018	National Science and Engineering Undergraduate Scholarship

Research Experience

Computational holographic displays

- Optimization of computer-generated hologram (CGH)
- CGH algorithms for aberration and vision correction
- Acceleration of CGH algorithms using parallel computing and low-rank approximation
- Metasurface design through joint optimization with CGH
- Camera-in-the-loop optimization of holographic display incorporating metasurfaces

Holographic display system

- Optical design of holographic near-eye displays
- Speckle reduced holographic displays with partially coherent light source

AR / VR near-eye displays

- Optical design of near-eye displays using holographic optical elements
- Optical design of near-eye displays using Pancharatnam-Berry phase lens

Visual perception

- User study for vision-correcting holographic displays
- Measurements of accommodation response of holographic displays
- Assessing 3D perceptual realism in light-field holographic displays
- Evaluation of perceptual hardware requirements of pupil steering displays

Research Experience - Projects

03/2021 - Present	Development of real-time high-speed renderer technology for ultra-realistic hologram generation Researcher , Institute for Information & Technology Planning (IITP)
09/2019 - Present	Development of vision assistant HMD and contents for legally blind and low visions Researcher , Institute for Information & Technology Planning (IITP)
03/2020 - 02/2021	Development of compact near-eye display using holographic optical element Researcher , Imaging Device Lab, Samsung Advanced Institute of Technology, Samsung Electronics

Services

Reviewer ACM Transactions on Graphics, IEEE ISMAR, Optics Letters, ETRI Journal

Reference

Prof. Yoonchan Jeong

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