Curriculum Vitae

Woongseob Han

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Education

- **Ph.D student**: Department of Electrical and Computer Engineering, Seoul National University, Seoul, Korea, Sep. 2024 to present.
- **Master of Science**: Department of Electrical and Computer Engineering, Inha University, Incheon, Korea, 2024.
    - Study on field of view, depth expression and visibility enhancements in optical see-through near-eye displays
    - Co-advised by Prof. Jae-Hyeung Park & Seung-Gol Lee
    - GPA: 4.45/4.5
- **Bachelor of Science**: Department of Information and Communication Engineering, Inha University, Incheon, Korea, Feb. 2022.
    - GPA: 4.18/4.5

Research Interests

- Augmented Reality (AR) and Virtual Reality (VR) Display Optics
- Advanced Three-Dimensional displays based on light field and holography
- Occlusion Optics and Learning-based Image Processing

Honors and Awards

- **Youlchon AI Young Researcher Scholarship:** Merit-based scholarship, 2025.
- **Samil Scholarship:** Full tuition scholarship, 2024.09-2026.08.
- **Outstanding Research Award**: Dean's Choice of the Best Researcher, Inha University, 2024.
- **Paper award:** Holographic augmented reality display with hard-edge occlusion using amplitude-modulation spatial light modulators, OSK, Optics and Photonics Congress, 2024.
- **Best Poster Paper Award**: the 23rd International Meeting on Information Display (IMID2023), Busan, Korea, Aug. 2023. (Paper title: Varifocal-Occlusion Supported Near-eye Display Using Stack of Geometric Phase Lenses and Electrically Switchable Half Wave Plate).

- **BK21 Excellent Research Award**, 2023.
- **Outstanding Research Award**: Excellence of Journal Publication, Inha University, 2023.
- **Inha University Tuition Scholarship:** Full tuition scholarship, 2022.03-2024.08.

Services

- **Reviewer**: Photonics Research, IEEE Transactions on Visualization and Computer Graphics (TVCG), IEEE ISMAR, Optics and Lasers in Engineering, Optics Express, Optics Continuum
- **Member:** Optica, OSK, SPIE

Skills / Technical Expertise

- **Programming:** Python, MATLAB (image processing, numerical simulation)
- **Optical design & Simulation:** Zemax OpticStudio (Python API), Python-based ray tracing
- **Display Technologies:** Near-eye display architectures, holography, light field displays, occlusion optics
- **Experimental Skills:** Optical prototyping, system alignment, polarization optics handling
- **Languages:** Korean (Native speaker)**,** English **(**Fluent)

Publications

- [J25-4] **W. Han**, C. Lee, and J.-H. Park, "Enhancing realism in holographic augmented reality displays through occlusion handling," Lasers and Photonics Reviews, vol. 19, no. 19, e01052 (2025). ***[Inside Front Cover]***
- [J25-3] J. Han, **W. Han**, and J.-H. Park, "Varifocal near-eye display with extended eyebox using dual slit-mirror array," Optics & Laser Technology, vol. 189, article 113053 (2025).
- [J25-2] G.-C. Han, **W. Han**, K.-S. Shin, and J.-H. Park, "Multifocal near-eye display with a vari-focal lens and adjustable aperture," Optics Express, vol. 33, no. 1, pp. 1132-1147 (2025).
- [J25-1] K.-S. Shin, J. Hong, **W. Han**, and J.-H. Park, "Field of view and angular-resolution enhancement in micro lens array type virtual reality near eye display using polarization grating," Optics Express, vol. 33, no. 1, pp. 263-278 (2025).
- [J24-3] M.-H. Choi, **W. Han**, K. Min, D. Min, G. Han, K.-S. Shin, M. Kim, and J.-H. Park, "Recent Applications of Optical Elements in Augmented and Virtual Reality Displays: a Review," ACS Applied Optical Materials, vol. 2, no. 7, pp. 1247-1268 (2024).
- [J24-2] **W. Han**, J.-W. Lee, J.-Y. Shin, M.-H. Choi, H.-R. Kim, and J.-H. Park, "Varifocal occlusion in optical see-through near-eye display with single phase-only Liquid Crystal on Silicon," Photonics Research, vol. 12, no 4, pp.833-854 (2024). ***[Top Downloads from April-June]***
- [J24-1] M. Kim, **W. Han**, and J.-H. Park, "Slim Maxwellian near-eye display for virtual reality

using point light source array," IEEE Journal of Selected Topics in Quantum Electronics, vol. 30, no. 2, article 3372001 (2024).

- [J22-3] **W. Han**, J. Han, Y.-G. Ju, J. Jang, and J.-H. Park, "Super multi-view near-eye display with a lightguide combiner", Optics Express, vol. 30, no. 26, pp. 46383-46403 (2022). ***[Editor's Pick]***
- [J22-2] **W. Han**, J.-M. Jeon, M.-H. Choi, and J.-H. Park, "Lightguide type Maxwellian near-eye display with enlarged horizontal field of view by optical reconfiguration of input image", Journal of Information Display, vol. 23, no. 3, pp. 201-211 (2022).
- [J22-1] M.-H. Choi, K.-S. Shin, J. Jang, **W. Han**, and J.-H. Park, "Waveguide-type Maxwellian near eye display using a pin-mirror holographic optical element array", Optics Letters, vol. 47, no. 2, pp. 405-408 (2022).

Conferences

- [IC25-1] **W. Han**, C. Lee, and J.-H. Park, "Occlusion-Capable Holographic Augmented Reality Near-Eye Display Using a Digital Micromirror Device," Optica Imaging Congress 2025, Digital Holography and 3-D Imaging (DH), paper DTh1C.2, Hyatt Regency Seattle, Seattle, USA, Aug. 2025.
- [IC24-1] **W. Han**, M.-H. Choi, and J.-H. Park, "Video see-through super multi-view near eye display using waveguide-type light source and ferroelectric liquid crystal on silicon," SPIE AR/VR/MR, Optical Architectures for Displays and Sensing in Augmented, Virtual, and Mixed Reality (AR, VR, MR) V, paper 12913-13, San Francisco, United States, (Jan. 2024)
- [IC23-2] **W. Han**, J.-W. Lee, J.-Y. Shin, M.-H. Choi, H.-R. Kim, and J.-H. Park, "Varifocal-occlusion supported near-eye display using stack of geometric phase lenses and electrically switchable half wave plate", The 23rd International Meeting on Information Display (IMID 2023), Busan, Korea (Aug. 2023) ***[Best Poster Paper Award]***
- [IC23-1] **W. Han**, and J.-H. Park, "Eyebox-Expanded Retina-Projection Near-eye Display Using Dihedral Corner Reflector Array", Optica Imaging Congress 2023, 3D Imaging Acquisition and Display: Technology, Perception and Applications (3D), Boston, United States (Aug. 2023)
- [IC22-1] **[Oral] W. Han**, J. Han, Y.-G. Ju, Jae-Hyeung Park, "Lightguide type optical see-through super multi view near-eye display using digital micromirror device and LED array", Digital Holography and Three-Dimensional Imaging (DH 2022), Cambridge, United Kingdom (Aug. 2022)
- [IC21-1] **W. Han**, J.-M. Jeon, M.-H. Choi, and J.-H. Park, "Horizontal Field of View Enhancement of a Waveguide-Type Near-Eye-Display by Restructuring Input Image", The 21st International Meeting on Information Display, Seoul, Korea (Aug. 2021)
- [DC25-1] **한웅섭**, 박재형, "액티브 푸리에 필터를 활용한 증강현실용 희소 홀로그래픽 이미지 최적화," 제32회 광전자 및 광통신 학술대회 (COOC 2025), paper T1D-II.03, 부산 해운대, 2025년 5월.
- [DC24-2] **한웅섭**, 민교식, 최명호, 박재형, "진폭변조 SLM을 이용한 폐색 적용 홀로그래픽 증강현실 디스플레이," Optics and Photonics Congress 2024, 한국광학회 하계학술대회, paper T1C-III.03, ICC 제주, 2024년 7월. ***[우수논문상]***

- [DC24-1] **한웅섭**, 최명호, 박재형, "강유전체 LCoS와 도파관 기반 광원을 이용한 초다시점 비디오 투과형 근안 디스플레이," 제35회 한국광학회 정기총회 및 2024 동계학술발표회, paper W3B-III.02, 수원컨벤션센터, 2024년 2월.
- [DC23-1] **한웅섭**, 이재원, 신중엽, 최명호, 김학린, 박재형, "전기적으로 초점 변환되는 기하위상 렌즈군을 이용한 가변초점 폐색 가능 증강현실 근안 디스플레이", 한국광학회 제34회 정기총회 및 2023 동계학술발표회, 부산, Korea, 2023년 2월.
- [DC22-1] **한웅섭**, 한지윤, 박재형, "디지털 마이크로미러 디바이스와 LED어레이를 이용한 도파관 기반 초다시점 투과형 근안 디스플레이", 한국광학회 Optics and Photonics Congress, 제주, Korea, 2022년 7월.

Patent

- [P24-1] C. Byun, **W. Han**, J.-H. Park, J. Han, C.-M. Kang, J. W. Shin, D. H. Ahn, "Display system," US20240329423A1 (2024)

Projects

- Development of Future Display Integrated Devices and Process Technology, Electronics and Telecommunications Research Institute (ETRI), Korea (Aug. 2025 ~ Present)
- Development of technology to improve chromatic aberration of lightweight and hyper-thin geometric phase modulation varifocal meta-lens for next-generation glasses-type XR devices and process technologies for high-efficiency and large-aperture manufacturing, National Research Foundation of Korea (Apr. 2024 ~ Present)
- Research on occlusion-capable holographic augmented reality 3D near-eye display, National Research Foundation of Korea, Korea (Feb. 2022 ~ Present)
- Near-eye light field device technology development for hyper-realistic metaverse service, Electronics and Telecommunications Research Institute (ETRI), Korea (Jan. 2022 ~ Dec. 2024)