Suyeon Choi

Curriculum Vitae

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Education

9/2020-Present **Ph.D. Student**, *Electrical Engineering*, Stanford University, Stanford, CA.
Advisor: Gordon Wetzstein

9/2019-6/2021 **M.Sc. Student**, *Electrical Engineering*, Stanford University, Stanford, CA.
Advisor: Gordon Wetzstein

3/2013-2/2019 **B.Sc. Student**, *Electrical Engineering*, Seoul National University, Seoul, Korea.
Advisor: Deog-kyoon Jeong, Soo-Mook Moon, and Byoungho Lee.
2-year absence to fulfill military duty (8/2015 – 5/2017)

3/2010-2/2013 Seoul Science High School, Seoul, Korea.

Internships

7/2022-9/2022 **Intern**, *Display Systems Research Team*, Meta Reality Labs, Redmond, WA.

7/2020-9/2020 **Intern**, *New Experience Team*, NVIDIA, Santa Clara, CA.
Culminated in first-authorship on an Optica paper [J5].
Worked with Jonghyun Kim, Ward Lopes and David Luebke. Manager: Morgan McGuire

Honors and Awards

2022-2024 Meta Research PhD Fellowship
2022 NVIDIA Graduate Fellowship Finalist
2020-2021 School of Engineering Fellowship, Stanford University
2019-2024 Kwanjeong Scholarship
2019-2021 Korea Government Scholarship
2019 2nd Prize, SPIE Student Optical Design Challenge 2019 [C1]
2013-2018 Presidential Science Scholarship, Korea
2012 Silver Medal, the International Physics Olympiad **(IPhO)**

Publications

*denotes equal contribution.

Journals

[J8] **S. Choi***, M. Gopakumar*, Y. Peng, J. Kim, and G. Wetzstein, "Neural 3D Holography: Learning Accurate Wave Propagation Models for 3D Holographic Virtual and Augmented Reality Displays", *ACM Transactions on Graphics* (Proc. SIGGRAPH Asia 2021).

[J7] Y. Peng*, **S. Choi***, J. Kim, and G. Wetzstein, "Speckle-free Holography with Partially Coherent Light Sources and Camera-in-the-loop Calibration", *Science Advances*, 2021.

[J6] M. Gopakumar, J. Kim, **S. Choi**, Y. Peng, and G. Wetzstein, "Unfiltered Holography: Optimizing High Diffraction Orders without Optical Filtering for Compact Holographic Displays", *Optics Letters*, 2021

[J5] **S. Choi**, J. Kim, Y. Peng, and G. Wetzstein "Optimizing image quality for holographic near-eye displays with Michelson Holography", *Optica*, 2021.

[J4] Y. Peng, **S. Choi**, N. Padmanaban, and G. Wetzstein "Neural Holography with Camera-in-the-loop Training", *ACM Transactions on Graphics* (Proc. SIGGRAPH Asia 2020).

[J3] D. Yoo*, S. Lee*, Y. Jo, J. Cho, **S. Choi**, and B. Lee "Volumetric Head-Mounted Display with Locally Adaptive Focal Blocks", *IEEE Transactions on Visualization and Computer Graphics*, 2020.

[J2] Y. Jo*, S. Lee*, D. Yoo, **S. Choi**, D. Kim, and B. Lee, "Tomographic Projector: Large Scale Volumetric Display with Uniform Viewing Experiences", *ACM Transactions on Graphics* (Proc. SIGGRAPH Asia 2019).

[J1] **S. Choi**, S. Lee, Y. Jo, D. Yoo, D. Kim, and B. Lee, "Optimal Binary Representation via Non-convex Optimization on Tomographic Displays", Optics Express, 2019.

Conference Proceedings

[C6] **S. Choi***, M. Gopakumar*, Y. Peng, J. Kim, M. O'Toole, and G. Wetzstein, "Time-multiplexed Neural Holography: A Flexible Framework for Holographic Near-eye Displays with Fast Heavily-quantized Spatial Light Modulators", in *SIGGRAPH 2022.*

[C5] J. Kim, M. Gopakumar, **S. Choi**, Y. Peng, W. Lopes, and G. Wetzstein, "Holographic glasses for Virtual Reality", in *SIGGRAPH 2022.*

[C4] **S. Choi**, Y. Peng, M. Gopakumar, J. Kim, G. Wetzstein, "Enabling Augmented-Reality Near-Eye and Head-Up Displays with Neural Holography", in *SID Symposium Digest of Technical Papers, 2022*

[C3] M. Gopakumar, Y. Peng, **S. Choi**, J. Kim, G. Wetzstein, "Advances in Neural Holographic Displays for Virtual and Augmented Reality", in *SID Symposium Digest of Technical Papers, 2022*

[C2] **S. Choi**, Y. Peng, J. Kim, and G. Wetzstein "High-quality holographic displays using double SLMs and camera-in-the-loop optimization", Proc. SPIE 11765, *Optical Architectures for Displays and Sensing in Augmented, Virtual, and Mixed Reality (AR, VR, MR) II*, 2021.

[C1] D. Yoo*, S. Lee*, Y. Jo, J. Cho, **S. Choi**, and B. Lee, "15 focal planes head-mounted display using LED array backlight", Proc. SPIE 11040, *SPIE Photonics West Student Optical Design Challenge*, 2019.

Public Demonstrations

2020 **Neural Holography**, Y. Peng, S. Choi, N. Padmanaban, J. Kim, G. Wetzstein, ACM SIGGRAPH 2020 Emerging Technologies.

Talks

2023 Partially-Coherent Neural Holography, *Emerging Digital Micromirror Device Based Systems and Applications XV* , San Francisco, CA.

2022 Partially-Coherent Neural Holography and Holographic Glasses, *Optica Virtual panel discussion, "Could Deep Learning Improve Visual Quality in Holographic Displays?"*, Virtual.

2022 Partially-Coherent Neural Holography and Holographic Glasses, *Optica 3D Image Acquisition and Display: Technology, Perception and Applications: Deep Learning and Machine Learning for 3D Imaging*, Vancouver, Canada.

2022 Enabling Augmented-Reality Near-Eye and Head-Up Displays with Neural Holography, *SID Display Week*, San Jose, CA.

2021 Neural Holography Pro: Computationally Enabling Compact, High-quality 3D Holographic Displays, *Graphics and Mixed Environment Seminar (GAMES)*, Virtual.

2021 Enabling Next-generation Holographic Displays with Artificial Intelligence, *Optica Frontiers in Optics LS AR/VR*, Virtual.

2021 High-quality holographic displays using double SLMs, *SPIE AR,VR,MR Technical Talks*, Virtual.

2020 Neural Holography: High-quality, Real-time Computer-generated Holographic Displays, *Graphics and Mixed Environment Seminar (GAMES)*, Virtual.

Teaching Experience

Teaching Assistant

Spring 21-22, Spring 2020-21 EE267: Virtual Reality, Stanford University

Undergraduate Teaching Assistant

Fall 2018 Digital Systems Design and Experiments, Seoul National University

Fall 2017 Introduction to Electromagnetism, Seoul National University

Spring 2015 Introduction to Circuit Theory and Laboratory, Seoul National University

Fall 2014 Digital Logic Design and Lab, Seoul National University

Tutor

Spring/Fall 2018, Spr 2015, Fall 2014 Basic Physics, Seoul National University

Professional Activities

Reviewer Nature Communications, ACM SIGGRAPH (Asia), Optics Letters, Optics Express, Photonics Research, Applied Optics, IEEE ISMAR

Member ACM SIGGRAPH, SPIE, SID, Optica