Daniel Rho

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Research Interests

computer vision, neural rendering, 3D / 4D representation learning, and inverse physics

Education

University of North Carolina at Chapel Hill — *North Carolina, United States*
Ph.D. in Computer Science — *Aug. 2024 - Present*
- Advisor: Roni Sengupta

Sungkyunkwan University — *Seoul, Korea*
MSE in Artificial Intelligence — *Sep. 2020 - Aug. 2022*
- Thesis: "Neural Residual Flow Fields for Efficient Video Representations" (Advisor: Jong Hwan Ko, Co-advisor: Eunbyung Park)

Sungkyunkwan University — *Seoul, Korea*
Bachelor of Economics & BSE in Computer Science and Engineering — *Mar. 2014 - Aug. 2020*
- Major GPA (Computer Science and Engineering): 4.44 / 4.5 (top 3%)
- Dean's List, 2018

Publications

Conference Publications

NFL-BA: Improving Endoscopic SLAM with Near-Field Light Bundle Adjustment
Andrea Dunn Beltran*, **Daniel Rho***, Marc Niethammer, Roni Sengupta
NeurIPS 2025 *- Advances in Neural Information Processing Systems*

F-3DGS: Factorized Coordinates and Representations for 3D Gaussian Splatting
Xiangyu Sun, Joo Chan Lee, **Daniel Rho**, Jong Hwan Ko, Usman Ali, Eunbyung Park
ACM MM 2024 *- Proceedings of the 32nd ACM International Conference on Multimedia*

Compact 3D Gaussian Representation for Radiance Field
Joo Chan Lee, **Daniel Rho**, Xiangyu Sun, Jong Hwan Ko, Eunbyung Park
CVPR 2024 (highlight) *- Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*

Coordinate-Aware Modulation for Neural Fields
Joo Chan Lee, **Daniel Rho**, Seungtae Nam, Jong Hwan Ko, Eunbyung Park
ICLR 2024 (spotlight) *- International Conference on Learning Representations*

Mip-Grid: Anti-aliased Grid Representations for Neural Radiance Fields
Seungtae Nam, **Daniel Rho**, Jong Hwan Ko, Eunbyung Park
NeurIPS 2023 *- Advances in Neural Information Processing Systems*

FFNeRV: Flow-Guided Frame-Wise Neural Representations for Videos
Joo Chan Lee, **Daniel Rho**, Jong Hwan Ko, Eunbyung Park
ACM MM 2023 *- Proceedings of the 31th ACM International Conference on Multimedia*

Masked Wavelet Representation for Compact Neural Radiance Fields
Daniel Rho*, Byeonghyeon Lee*, Seungtae Nam, Joo Chan Lee, Jong Hwan Ko, Eunbyung Park
CVPR 2023 *- Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*

Regression to Classification: Waveform Encoding for Neural Field-Based Audio Signal Representation
TaeSoo Kim*, **Daniel Rho***, Gahui Lee, JaeHan Park, Jong Hwan Ko
ICASSP 2023 *- IEEE International Conference on Acoustics, Speech and Signal Processing*

Neural Residual Flow Fields for Efficient Video Representations
Daniel Rho, Junwoo Cho, Jong Hwan Ko, Eunbyung Park
ACCV 2022 *- Proceedings of the Asian Conference on Computer Vision*

Streamable Neural Fields
Junwoo Cho*, Seungtae Nam*, **Daniel Rho**, Jong Hwan Ko, Eunbyung Park
ECCV 2022 *- Proceedings of the European Conference on Computer Vision*

NAS-VAD: Neural Architecture Search for Voice Activity Detection
Daniel Rho, Jinhyeok Park, Jong Hwan Ko
Interspeech 2022 *- Proceedings of Interspeech*

Preprints

ProJo4D: Progressive Joint Optimization for Sparse-View Inverse Physics Estimation
Daniel Rho, Jun Myeong Choi, Biswadip Dey, Roni Sengupta
arXiv preprint arXiv:2506.05317 (2025)

Understanding Contrastive Learning Through the Lens of Margins
Daniel Rho, TaeSoo Kim, Sooill Park, Jaehyun Park, JaeHan Park
arXiv preprint arXiv:2306.11526 (2023)

Professional Experience

Graduate Research Assistant — *Chapel Hill, NC, USA*
University of North Carolina at Chapel Hill — *Aug. 2024 - Present*

Research Intern — *NC, USA*
Lenovo Research — *May. 2025 - July. 2025*

Research Engineer — *Seoul, Korea*
AI Tech Lab, KT — *Jul. 2022 - Jun. 2024*

Graduate Research Assistant — *Seoul, Korea*
IRIS LAB, Sungkyunkwan University — *Sep. 2020 - Jul. 2022*

Undergraduate Research Assistant — *Seoul, Korea*
IRIS LAB, Sungkyunkwan University — *Jun. 2019 - Aug. 2020*

Skills

Programming CUDA, Python (PyTorch, TensorFlow), C/C++

Patents

"A Method for Inferring of Generating Direction of Sound Using Deep Network and an Apparatus for the Same" — *Korea*
Application No.: 10-2020-0032737 — *2020*

Research Projects

"Next-gen 3D Modeling of Endoscopy Videos" — *USA*
National Institutes of Health, USA — *2024-2025*

"Deep Learning Techniques for Multi-Intelligence using Drones" — *Korea*
Ministry of Science and ICT, Korea — *Jan. 2021 - Dec. 2021*

"Deep Neural Network Based Real-Time Accurate Voice Source Localization using Drones" — *Korea*
Ministry of Science and ICT, Korea — *Jun. 2019 - Dec. 2020*

Awards, Honors and Scholarships

Jan. 2021 **First Place & Ministerial Award**, Artificial Intelligence Grand Challenge, Ministry of Science and ICT — *Korea*
Fall 2020 **Sungkyun Honorable Scholarship (Fall 2020 - Spring 2022)**, Sungkyunkwan University — *Korea*
Jun. 2019 **Third Place**, Artificial Intelligence Grand Challenge, Ministry of Science and ICT — *Korea*
Fall 2019 **Academic Excellence Scholarship**, Sungkyunkwan University — *Korea*
Fall 2018 **Academic Excellence Scholarship**, Sungkyunkwan University — *Korea*

Academic Services

Conference Reviewer CVPR 2024-2026, ICCV 2025, NeurIPS 2024-2025, ICML 2025, ICLR 2025-2026, ACM MM 2024-2025