

Bochang Moon

Associate Professor

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Education

- **Ph.D.** in Computer Science, KAIST, Korea Feb. 2010 – Aug. 2014
Thesis: Acceleration Techniques for Monte Carlo Ray Tracing
Advisor: Sung-Eui Yoon
- **M.S.** in Computer Science at KAIST, Korea Feb. 2008 – Jan. 2010
Thesis: Cache-Oblivious Ray Reordering
Advisor: Sung-Eui Yoon
- **B.S.** in Computer Engineering at Chung-Ang University, Korea Mar. 2004 – Feb. 2008
Graduated top of the college of engineering (GPA: 4.35/4.50)

Professional Experience

- **Associate Professor**, Gwangju Institute of Science and Technology Feb. 2022 – present
- **Assistant Professor**, Gwangju Institute of Science and Technology Sep. 2016 – Feb. 2022
- **Post Doc**, Disney Research Zürich (based on Edinburgh) Nov. 2014 – July 2016
- **Post Doc**, Dept. of Computer Science, KAIST Sep. 2014 – Oct. 2014
- **Research Intern**, Adobe Systems Inc., USA Jun. 2011 – Sep. 2011

Research Summary

- Research focus: Development of efficient algorithms for Monte Carlo rendering, image denoising, and differentiable rendering
- 12 publications in ACM SIGGRAPH / SIGGRAPH Asia (including ACM TOG)
- 2 papers in IEEE Transactions on Visualization and Computer Graphics (TVCG)
- 9 papers in Computer Graphics Forum (CGF)
- ACM SIGGRAPH Asia 2022 Best Paper Award
- Associate Editor, The Visual Computer (2016 – present)

Awards

- Best Paper Award at ACM SIGGRAPH Asia 2022
 - Related work: Neural James-Stein Combiner for Unbiased and Biased Renderings

Curriculum Vitae (Bochang Moon)

- Author Service Award (Editor of Distinction Awards), Springer Nature, 2026
 - In recognition of editorial service as an Associate Editor for The Visual Computer
- Best Paper Honorable Mention Award at Pacific Graphics 2018
 - Related work: Feature Generation for Adaptive Gradient-Domain Path Tracing
- GIST Education Innovation Award 2024
- GIST Teaching Award 2021
- Significant New Researcher Award at Korea Computer Graphics Society (KCGS) 2014
- 3rd place at ACM Student Research Competition (SRC) grand finals held at the ACM awards banquet
1st place at ACM SRC held at ACM SIGGRAPH 2009
 - Related work: RACBVHs: Random-Accessible Compressed Bounding Volume Hierarchies

Publications (International Conference / Journal Papers)

★ indicates publications in premier graphics venues.

1. ★ **Imperfect Image-Space Control Variates for Monte Carlo Rendering**
Chanu Yang, [Bochang Moon](#)
ACM Transactions on Graphics (SIGGRAPH Asia 2025), 44(6), pp. 205:1–205:11, Dec. 2025
2. **Lighting Model-Guided Initialization for Gradient Descent-Based Projector Compensation**
Woochan Sun, Geonu Noh, Kwanghee Ko, [Bochang Moon](#)
IEEE Access, vol. 13, pp. 163607 - 163617, Sep. 2025
3. ★ **James-Stein Gradient Combiner for Inverse Monte Carlo Rendering**
Jeongmin Gu, [Bochang Moon](#)
ACM SIGGRAPH 2025 Conference Proceedings, pp. 67:1 – 67:10, July 2025
4. ★ **Online Neural Denoising with Cross-Regression for Interactive Rendering**
Hajin Choi, Seokpyo Hong, Inwoo Ha, Nahyup Kang, [Bochang Moon](#)
ACM Transactions on Graphics (SIGGRAPH Asia 2024), 43(6), pp. 221:1–221:12, Dec. 2024
5. ★ **Target-Aware Image Denoising for Inverse Monte Carlo Rendering**
Jeongmin Gu, Jonghee Back, Sung-Eui Yoon, [Bochang Moon](#)
ACM Transactions on Graphics (SIGGRAPH 2024), 43(4), pp. 124:1–124:11, July 2024
6. **Joint Self-Attention for Denoising Monte Carlo Rendering**
Geunwoo Oh, [Bochang Moon](#)
The Visual Computer (CGI 2024), 40, 7, pp. 4623 – 4634, Jul. 2024
7. ★ **Input-Dependent Uncorrelated Weighting for Monte Carlo Denoising**
Jonghee Back, Binh-Son Hua, Toshiya Hachisuka, [Bochang Moon](#)
ACM SIGGRAPH Asia 2023 Conference Proceedings, pp. 9:1 – 9:10, Dec. 2023
8. **Enhanced Direct Lighting Using Visibility-Aware Light Sampling**
Geonu Noh, Hajin Choi, [Bochang Moon](#)
Computer Graphics International (CGI) Conference Proceedings, 2023

9. **Adaptively weighted discrete Laplacian for inverse rendering**
Hyeonjang An, Wonjun Lee, [Bochang Moon](#)
The Visual Computer (CGI 2023), 39, 8, pp. 3211-3220, Aug. 2023
10. **Robust Image Denoising of No-Flash Images Guided by Consistent Flash Images**
Geunwoo Oh, Jonghee Back, Jae-Pil Heo, [Bochang Moon](#)
Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 37(2), pp. 1993-2001, Jun 2023 [oral presentation]
11. **★ Neural James-Stein Combiner for Unbiased and Biased Renderings**
Jeongmin Gu, Jose A. Iglesias-Guitian, [Bochang Moon](#)
ACM Transactions on Graphics (SIGGRAPH Asia 2022), 41(6), pp. 262:1-262:14, Dec 2022
Received Best Paper Award at SIGGRAPH Asia 2022
12. **Online Illumination Learning for Interactive Global Illumination in Augmented Reality**
Wonjun Lee, Piljoong Jeong, Hajin Choi, Jinwoo Kim, [Bochang Moon](#)
IEEE Access, vol. 10, pp. 109498-109509, Oct 2022
13. **★ Self-Supervised Post-Correction for Monte Carlo Denoising**
Jonghee Back, Binh-Son Hua, Toshiya Hachisuka, [Bochang Moon](#)
Proceedings of ACM SIGGRAPH 2022, pp. 18:1-18:8, July 2022
14. **Real-Time Denoising of Volumetric Path Tracing for Direct Volume Rendering**
Jose A. Iglesias-Guitian, Prajita Mane, [Bochang Moon](#)
IEEE Transactions on Visualization and Computer Graphics (TVCG), vol. 28, no. 7, pp. 2734-2747, July 2022
15. **Projector Compensation Framework Using Differentiable Rendering**
Jino Park, Donghyuk Jung, [Bochang Moon](#)
IEEE Access, 10, pp. 44461 - 44470, April 2022

--- Promoted to an associate professor ---
16. **Consistent Post-Reconstruction for Progressive Photon Mapping**
Hajin Choi, [Bochang Moon](#)
Computer Graphics Forum (Proceedings of Pacific Graphics 2021), vol. 40, no. 7, pp. 121-130, Oct. 2021
17. **Similar Patch Selection in Embedding Space for Multi-View Image Denoising**
Geunwoo Oh, Dong-Wan Choi, [Bochang Moon](#)
IEEE Access, 9, pp. 98581 - 98589, July 2021
18. **★ Deep combiner for independent and correlated pixel estimates**
Jonghee Back, Binh-Son Hua, Toshiya Hachisuka, [Bochang Moon](#)
ACM Transactions on Graphics (SIGGRAPH Asia 2020), vol. 39, no. 6, pp. 242:1 – 242:12, Nov. 2020
19. **Adaptive kernel inference for dense and sharp occupancy grids**
Youngsun Kwon, [Bochang Moon](#), Sung-Eui Yoon
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2020
20. **Gradient outlier removal for gradient-domain path tracing**
Saerom Ha, Sojin Oh, Jonghee Back, Sung-Eui Yoon, [Bochang Moon](#)
Computer Graphics Forum (Proceedings of Eurographics 2019), vol. 38, no. 2, pp. 245-253, Jun. 2019

21. Feature generation for adaptive gradient-domain path tracing

Jonghee Back, Sung-Eui Yoon, [Bochang Moon](#)

Computer Graphics Forum (Proceedings of Pacific Graphics 2018), vol. 37, no.7, pp. 65-74, Oct. 2018

Received **Best Paper Honorable Mention Award** at Pacific Graphics 2018

22. Noise reduction on G-buffers for Monte Carlo filtering

[Bochang Moon](#), Jose A Iglesias-Guitian, Steven McDonagh, Kenny Mitchell

Computer Graphics Forum (Presented at Eurographics Symposium on Rendering (EGSR) 2017), vol. 36, no. 8, pp. 600-612, Dec. 2017

--- Joined GIST as an assistant professor ---

23. Pixel history linear models for real-time temporal filtering

Jose A Iglesias-Guitian, [Bochang Moon](#), Charalampos Koniaris, Eric Smolikowski, Kenny Mitchell

Computer Graphics Forum (Proceedings of Pacific Graphics 2016), vol. 35, no. 7, pp. 363-372, Oct. 2016

24. Nonlinearly weighted first-order regression for denoising Monte Carlo renderings

Benedikt Bitterli, Fabrice Rousselle, [Bochang Moon](#), Jose A. Iglesias-Guitian, David Adler, Kenny Mitchell, Wojciech Jarosz, Jan Novak

Computer Graphics Forum (Proceedings of Eurographics Symposium on Rendering (EGSR) 2016), vol. 35, no. 4, July 2016

25. User, metric, and computational evaluation of foveated rendering methods

Nicholas T. Swafford, Charalampos Koniaris, Jose A. Iglesias-Guitian, [Bochang Moon](#), Darren Cosker, Kenny Mitchell

Proceedings of ACM Symposium on Applied Perception, July 2016

26. ★ Adaptive polynomial rendering

[Bochang Moon](#), Steven McDonagh, Kenny Mitchell, Markus Gross

ACM Transactions on Graphics (SIGGRAPH 2016), vol. 35, no. 4, pp. 40:1-40:10, July 2016

27. ★ Adaptive rendering with linear predictions

[Bochang Moon](#), Jose A. Iglesias-Guitian, Sung-Eui Yoon, Kenny Mitchell

ACM Transactions on Graphics (SIGGRAPH 2015), vol. 34, no. 4, pp. 121:1-121:11, Aug. 2015

28. Recent advances in adaptive sampling and reconstruction for Monte Carlo rendering

Matthias Zwicker, Wojciech Jarosz, Jaakko Lehtinen, [Bochang Moon](#), Ravi Ramamoorthi, Fabrice Rousselle, Pradeep Sen, Cyril Soler, Sung-Eui Yoon

Computer Graphics Forum (Proceedings of Eurographics 2015), vol. 34, no. 2, pp. 667-681, May 2015

--- Became a Ph.D. ---

29. ★ Adaptive rendering based on weighted local regression

[Bochang Moon](#), Nathan Carr, Sung-Eui Yoon

ACM Transactions on Graphics (Presented at SIGGRAPH 2015), vol. 33, no. 5, pp. 170:1-170:14, Aug. 2014

30. P-RPF: pixel-based random parameter filtering for Monte Carlo rendering

Hyosub Park, [Bochang Moon](#), Soomin Kim, Sung-Eui Yoon

Proceedings of Computer-Aided Design and Computer Graphics (CAD/Graphics), pp. 123 - 130, Nov. 2013

31. Robust image denoising using a virtual flash image for Monte Carlo ray tracing

[Bochang Moon](#), Jong Yun Jun, JongHyeob Lee, Kunho Kim, Toshiya Hachisuka, Sung-Eui Yoon

Computer Graphics Forum (Presented at Eurographics Symposium on Rendering (EGSR) 2014), vol. 32, No. 1, pp. 139-

151, Feb. 2013

32. ★ **Cache-oblivious ray reordering**

[Bochang Moon](#), Youngyong Byun, Tae-Joon Kim, Pio Claudio, Hye-sun Kim, Yun-ji Ban, Seung Woo Nam, Sung-Eui Yoon
ACM Transactions on Graphics (Presented at SIGGRAPH 2011), vol. 29, no. 3, pp. 28:1-28:10, June 2010

33. **HCCMeshes: hierarchical-culling oriented compact meshes**

Tae-Joon Kim, Yongyoung Byun, Yongjin Kim, [Bochang Moon](#), Seungyong Lee, Sung-Eui Yoon
Computer Graphics Forum (Proceedings of Eurographics 2010), vol. 29, no. 2, pp. 299-308, May 2010

34. **RACBVHs: random-accessible compressed bounding volume hierarchies**

Tae-Joon Kim, [Bochang Moon](#), Duksu Kim, Sung-Eui Yoon
IEEE Transactions on Visualization and Computer Graphics (TVCG), vol. 16, no. 2, pp. 273-286, Mar. 2010

Presentations (Short Papers/Posters/Exhibitions)

1. **Interactive ray-traced area lighting with adaptive polynomial filtering**

Jose A. Iglesias Guitian, [Bochang Moon](#), Kenny Mitchell
The 13th European Conference on Visual Media Production (CVMP), London, 2016

2. **IRIDIUM: immersive rendered interactive deep media**

Babis Koniaris, Maggie Kosek, Ivan Huerta, Karen Darragh, Charles Malleson, Joanna Jamrozy, Nick Swafford, Jose A. Iglesias Guitian, [Bochang Moon](#), Ali Israr, Kenny Mitchell
VR Village in SIGGRAPH 2016

Patents in Korea/US (registered)

1. **Target-Aware image-based denoising method and system capable of inverse rendering**

[Bochang Moon](#), Jeongmin Gu, Jonghee Back
Registration #: 10-2937562, Korea, Mar. 06, 2026

2. **Apparatus for improving image quality and method thereof**

[Bochang Moon](#), Jonghee Back
Registration #: 12,423,789, US, Sep. 23, 2025

3. **Apparatus and method for improving image quality using James-Stein combiner**

[Bochang Moon](#), Jeongmin Gu
Registration #: 10-2777288, Korea, Feb. 28, 2025
Registration #: 12,626,336, US, May. 12, 2026

4. **A photo realistic image generation apparatus**

[Bochang Moon](#), Saerom Ha, Jonghee Back, Sojin Oh, Sung-Eui Yoon
Registration #: 10-2694907, Korea, Aug. 08, 2024

5. **Apparatus and method for improving no-flash image quality using flash image**

[Bochang Moon](#), Geunwoo Oh, Jonghee Back
Registration #: 10-2682208, Korea, July 02, 2024
Registration #: 12,524,846, US, Jan. 13, 2026

6. **Apparatus for enhancing Image quality, and method for the same**

Curriculum Vitae (Bochang Moon)

[Bochang Moon](#), Jonghee Back

Registration #: 1023396190000, Korea, Dec. 10, 2021

7. Method and Apparatus for Adaptive Kernel Inference for Dense and Sharp Occupancy Grids

Sung-Eui Yoon, [Bochang Moon](#), Youngsun Kwon

Registration #: 1023190150000, Korea, Oct. 25, 2021

8. Denoising method in image processing device and method for generating feature therefor

Jonghee Back, Sung-Eui Yoon, [Bochang Moon](#)

Registration #: 1021354590000, Korea, July 13, 2020

9. Noise reduction on G-buffers for Monte Carlo filtering

Kenneth Mitchell, Jose A Iglesias-Guitian, [Bochang Moon](#), Steven McDonagh

Registration #: 10403026, US, Sep. 12, 2019

10. System and method of presenting views of a virtual space

Kenneth Mitchell, Charalampos Koniaris, Jose A Iglesias-Guitian, [Bochang Moon](#), Eric Smolikowski

Registration #: 09996949, US, June 12, 2018

11. Adaptive polynomial rendering

[Bochang Moon](#), Markus Gross, Steven McDonagh, Kenneth Mitchell

Registration #: 09959664, US, May 01, 2018

12. Adaptive rendering with linear predictions

Kenneth Mitchell, [Bochang Moon](#), Jose A Iglesias-Guitian

Registration #: 9892549, US, Feb. 13, 2018

13. Adaptive sampling guided by multilateral filtering

[Bochang Moon](#), Nathan Carr

Registration #: 08824834, US, Sep. 02, 2014

14. Method for removing image noise on basis of stochastic rendering

Sung-Eui Yoon, [Bochang Moon](#), Kunho Kim, Jong Yun Jun, Jong Hyeob Lee

Publication #: WO/2013/137522, PCT, Sep. 19, 2013

15. Noise reduction method for stochastic rendering image

Sung-Eui Yoon, [Bochang Moon](#), Kunho Kim, Jong Yun Jun, Jong Hyeob Lee

Registration #: 1012827000000, Korea, July 01, 2013

Professional Services (international)

➤ Editorial board member

- Visual Computer, Sep. 2016 - present

➤ Program committee member

- ACM SIGGRAPH Asia (Technical Communications and Posters): 2020
- ACM SIGGRAPH Asia (CoI Coordinator): 2025
- Eurographics Symposium on Rendering (EGSR): 2017 – 2019, 2024 – 2025
- ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D): 2018 – 2019

Curriculum Vitae (Bochang Moon)

- Pacific Graphics (PG): 2019, 2022
 - Computer Graphics International (CGI): 2018 - 2026
 - Graphics Interface (GI): 2022 – 2024, 2026
 - AAAI: 2023
- Reviewer
- ACM SIGGRAPH, ACM SIGGRAPH ASIA, ACM Transactions on Graphics, IEEE TVCG, Eurographics, Pacific Graphics, EGSR, Visual Computer, IEEE VR, etc.

Research Grants / Contracts (only external)

1. On rendering research (details will be given when necessary), 2026.01– 2027.12
 - PI, Agency for Defense Development (ADD)
2. Development of a 6DoF Object Pose Estimation Method for XR Interaction, 2025.09– 2026.05
 - PI, Korea Institute of Science and Technology Information (KISTI), \$50K
3. Deep Learning based Denoising with Imperfect Dataset for Photorealistic Rendering, 2023.03– 2026.02
 - PI, National Research Foundation of Korea (NRF), \$425K
4. On rendering research (details will be given when necessary), 2022.08– 2024.09
 - PI, Samsung
5. Optimization for learning-based novel-view synthesis using graphics techniques, 2022.05– 2023.12
 - PI, ETRI (Electronics and Telecommunications Research Institute), \$120K
6. The development of object media technology based on multiple video sources, 2022.04– 2025.12
 - Co-PI, Ministry of Science and ICT (MSIT, Korea), \$550K
7. Development of Space-telling Design Tool and Platform based on Art Museum XR Twin for Supporting Exhibition Planning, 2021.07 – 2023.12
 - PI, Ministry of Culture, Sports and Tourism (MCST, Korea), \$520K
8. Denoising for photorealistic rendering with correlated sampling, 2020.03 – 2023.02
 - PI, National Research Foundation of Korea (NRF, Korea), \$450K
9. Development of intelligent agent-based smart stage exhibition dynamic space cognitive mediawall platform technology, 2020.06 – 2022.12
 - Ministry of Culture, Sports and Tourism (MCST, Korea), \$300K
10. Development of AI technology to generate and validate the task plan for assembling furniture in the real and virtual environment by understanding the unstructured multi-modal information from the assembly manual, 2019.04-2020.12
 - National IT Industry Promotion Agency (NIPA, Korea), \$230K
11. Development of multi-dimensional imaging technology and platform for performance immersion, 2018.04-2020.12
 - Ministry of Culture, Sports and Tourism (MCST, Korea), \$112K
12. Real-time 4D reconstruction of dynamic objects for ultra-realistic service, 2018.01-2020.12

Curriculum Vitae (Bochang Moon)

- PI, Ministry of Science and ICT (MSIT, Korea), \$535K
- 13. Photo-realistic rendering in augmented reality, 2017.12-2020.11
 - PI, Samsung, \$450K
- 14. Denoising for Physically based Rendering, 2017.03 – 2020.02
 - PI, National Research Foundation of Korea (NRF), \$301K
- 15. Developed intelligent UX/UI technology for AR glasses-based docent operation, 2017.04 – 2017.12
 - Ministry of Culture, Sports and Tourism (MCST, Korea), \$30K

Teaching

- Advanced Photorealistic Rendering (3 credits)
 - Fall 2022
- Computer Graphics & Applications (3 credits)
 - Fall 2019, Fall 2023, Fall 2025
- Computer Graphics (3 credits)
 - Spring in 2017 - 2026
- Photorealistic Rendering (3 credits)
 - Fall in 2017 - 2018, Fall in 2020 – 2021, Fall in 2024
- Culture Technology Program Seminar (1 credit)
 - Spring 2017, Fall 2017, Spring 2018, Spring 2021, Fall 2021, Fall 2024,
- Character Design, Animation, and Rendering (KMOOC course)
 - 2017

Supervised Students (Ongoing)

- PhD Candidates
 - Hajin Choi (2018.03 - present), GeonU Noh (2020.03 – present), Chanu Yang (2022.03 – present), Seongil Kim (2024.03 – present), Hyunjin Jung (2024.03 – present)
- MS Candidates
 - Juhwan Bae(2026.03 – present), Eunji Kim (2026.03 – present), Jungsik Oh (2026.03 – present), Giwon Lee (2026.03 – present)

Supervised Students (Alumni)

- PhD students
 - Wonjun Lee (2018.03 – 2026.02), Jungmin Gu (2020.03 – 2025.08), JongHee Back (2019.09 – 2024.02), Geunwoo Oh (2018.02 – 2024.02)
- MS students

Curriculum Vitae (Bochang Moon)

- Donghee John(2024.03 – 2026.02), Jangwon Hwang(2024.03 – 2026.02), Woochan Sun (2023.03 – 2025.08), Yewon Cho (2023.03 – 2025.02), Jongbeom Ryu (2022.02 – 2023.08), Yunha Sohn (2021.09 – 2023.08), Hyeonjang An (2021.02 – 2023.02), Donghyuk Jung (2021.02 – 2023.02), Jino Park (2019.09 – 2022.02), Piljoon Jeong (2017.09 – 2022.02), Saerom Ha (2017.03 – 2019.02), Sojin Oh (2017.08 – 2019.02), Prajita Mane (2017.09 – 2019.08), JongHee Back (2018.03 – 2019.08), JungMin Goo (2018.03 – 2020.02), Junyoung Park (2019.03 – 2020.08)