Minh-Quan Viet Bui

Ph.D. Candidate · Computer Vision · Neural Rendering · 3D/4D Reconstruction

VIC Lab, KAIST, Daejeon, Republic of Korea

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"Building Efficient and Generalizable Methods for 3D/4D Scene Understanding"

Research Statement

I am a Ph.D. candidate at KAIST (VIC Lab, advised by Prof. Munchurl Kim) specializing in 3D computer vision, neural rendering, and 3D/4D scene reconstruction. My research builds **efficient, robust, and generalizable** representations of 3D/4D scenes from images and videos, spanning from per-scene optimization to feed-forward, generalizable approaches with applications in AR/VR, autonomous systems, computational photography, world modeling, and robotics.

My work has been published at **CVPR 2025 & 2026 (Highlight)**, **ECCV 2026**, **AAAI 2026**, and **IEEE TPAMI** (IF: 20.8). I am actively seeking **visiting researcher, research internship, or postdoctoral positions** in 3D computer vision and world modeling.

Education

Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, Republic of Korea

Ph.D. Candidate, Electrical Engineering — *Mar. 2022 – Present*

- Advisor: Prof. Munchurl Kim, Visual Intelligence and Computing (VIC) Lab.
- Research areas: 3D Gaussian Splatting (3DGS), Neural Radiance Fields (NeRF), Dynamic Scene Reconstruction, Motion Deblurring, Feed-forward View Synthesis.
- Dissertation topic: *Efficient and Robust 3D/4D Scene Reconstruction from Monocular and Multi-view Images*.
- KAIST Graduate Program Scholarship (full tuition waiver, monthly living stipend).

Ho Chi Minh City University of Technology – VNU (HCMUT-VNU)

Ho Chi Minh City, Vietnam

B.Sc., Computer Science — *Sep. 2017 – Aug. 2021*

- Thesis: "Monocular 3D Object Detection for Autonomous Driving using Ground-Guide Model and Adaptive Convolution."

Research Experience

Ph.D. Researcher

Daejeon, Republic of Korea

VIC Lab, KAIST (Advisor: Prof. Munchurl Kim) — *Mar. 2022 – Present*

- **AirSplat** (*ECCV 2026*): a robust feed-forward 3D Gaussian Splatting framework that adapts 3D vision foundation models for pose-free novel view synthesis; resolves pose-geometry misalignment with a self-consistent pose-alignment feedback loop and rating-based opacity matching that filters degraded primitives.
- **EcoSplat** (*CVPR 2026* ***Highlight***): a feed-forward 3D Gaussian Splatting framework where users specify any target Gaussian count at inference, with no per-scene retraining; best quality across efficiency budgets on RE10K and ACID.
- **MoBGS** (*AAAI 2026*): a motion-deblurring dynamic 3D Gaussian Splatting method for blurry monocular video using neural-ODE camera trajectory estimation and physical exposure modeling; $\sim$**12% better reconstruction** than prior SOTA on Stereo Blur at **480 FPS**.
- **SplineGS** (*CVPR 2025*): a spline-based dynamic 3D Gaussian Splatting framework for real-time rendering from monocular video, eliminating COLMAP preprocessing; **400 FPS** on the NVIDIA dataset.
- **MoBluRF** (*IEEE TPAMI 2025, IF: 20.8*): a two-stage motion-deblurring NeRF for blurry monocular video, jointly correcting camera poses and decomposing camera/object motion blur; state-of-the-art on the self-introduced Blurry iPhone benchmark and Stereo Blur.
- **ProNeRF** (*IEEE Access 2024, IF: 3.4*): a projection-aware ray sampling network for NeRF that focuses queries on high-density 3D regions; **15–23**$\times$ **faster** than vanilla NeRF with **+0.95 dB** over HyperReel.

Research Assistant

Ho Chi Minh City, Vietnam

Ho Chi Minh City University of Technology (HCMUT-VNU) — *2019 – 2021*

- **Cross-Domain Depth Estimation** (*Image & Vision Computing 2024, IF: 4.2*): a meta-learning online domain adaptation framework for monocular depth estimation; state-of-the-art on KITTI Eigen without target-domain supervision.
- **GAC3D / eGAC3D** (*PeerJ Computer Science 2021 & 2022, IF: 3.8*): monocular 3D object detection networks using ground-guide geometric priors and depth-adaptive convolutions for accurate 3D bounding-box estimation from single images.

Publications

** Equal contribution / co-first authorship.* **9 first/co-first-author publications** (4 top-tier conferences, 5 journals).

Conference Papers

[C1] **Minh-Quan Viet Bui***, Jaeho Moon*, and Munchurl Kim. "AirSplat: Alignment and Rating for Robust Feed-Forward 3D Gaussian Splatting." *Eur. Conf. Comput. Vis.* ***(ECCV)***, 2026.

[C2] **Minh-Quan Viet Bui***, Jongmin Park*, Juan Luis Gonzalez Bello, Jaeho Moon, Jihyong Oh, and Munchurl Kim. "EcoSplat: Efficiency-controllable Feed-forward 3D Gaussian Splatting from Multi-view Images." *IEEE/CVF Conf. Comput. Vis. Pattern Recognit.* ***(CVPR)***, Denver, CO, 2026. **(Highlight)**

[C3] **Minh-Quan Viet Bui***, Jongmin Park*, Juan Luis Gonzalez Bello, Jaeho Moon, Jihyong Oh, and Munchurl Kim. "MoBGS: Motion Deblurring Dynamic 3D Gaussian Splatting for Blurry Monocular Video." *AAAI Conf. Artif. Intell.* ***(AAAI)***, 2026.

[C4] Jongmin Park*, **Minh-Quan Viet Bui***, Juan Luis Gonzalez Bello, Jaeho Moon, Jihyong Oh, and Munchurl Kim. "SplineGS: Robust Motion-Adaptive Spline for Real-Time Dynamic 3D Gaussians from Monocular Video." *IEEE/CVF Conf. Comput. Vis. Pattern Recognit.* ***(CVPR)***, Nashville, TN, 2025.

Journal Papers

[J1] **Minh-Quan Viet Bui***, Jongmin Park*, Jihyong Oh, and Munchurl Kim. "MoBluRF: Motion Deblurring Neural Radiance Fields for Blurry Monocular Video." *IEEE Trans. Pattern Anal. Mach. Intell.* ***(TPAMI)***, pp. 1–18, 2025, doi: 10.1109/TPAMI.2025.3574644. **[IF: 20.8]**

[J2] Juan Luis Gonzalez Bello*, **Minh-Quan Viet Bui***, and Munchurl Kim. "ProNeRF: Learning Efficient Projection-Aware Ray Sampling for Fine-Grained Implicit Neural Radiance Fields." *IEEE Access*, vol. 12, pp. 56799–56814, 2024, doi: 10.1109/ACCESS.2024.3390753. **[IF: 3.4]**

[J3] Phan Thi Huyen Thanh*, **Minh-Quan Viet Bui***, Duc Dung Nguyen, Tran Vu Pham, Truong Vinh Truong Duy, and Natori Naotake. "Transfer Multi-Source Knowledge via Scale-Aware Online Domain Adaptation in Depth Estimation for Autonomous Driving." *Image Vis. Comput.*, vol. 141, p. 104871, 2024, doi: 10.1016/j.imavis.2023.104871. **[IF: 4.2]**

[J4] Duc Tuan Ngo*, **Minh-Quan Viet Bui***, Duc Dung Nguyen, and Hoang-Anh Pham. "eGAC3D: Enhancing Depth-Adaptive Convolution and Depth Estimation for Monocular 3D Object Pose Detection." *PeerJ Comput. Sci.*, vol. 8, p. e1144, 2022, doi: 10.7717/peerj-cs.1144. **[IF: 3.8]**

[J5] **Minh-Quan Viet Bui***, Duc Tuan Ngo*, Hoang-Anh Pham, and Duc Dung Nguyen. "GAC3D: Improving Monocular 3D Object Detection with Ground-Guide Model and Adaptive Convolution." *PeerJ Comput. Sci.*, vol. 7, p. e686, 2021, doi: 10.7717/peerj-cs.686. **[IF: 3.8]**

Invited Talks

"EcoSplat: Efficiency-controllable Feed-forward 3D Gaussian Splatting from Multi-view Images" — *IEEE/CVF CVPR 2026, Denver, CO*

NVIDIA Booth Spotlight Talk — *June 2026*

Technical Skills

Deep Learning	PyTorch, JAX, CUDA, Python
Neural Rendering	3D Gaussian Splatting (3DGS), Neural Radiance Fields (NeRF), Differentiable Rendering, Point Cloud Processing
Computer Vision	Dynamic Scene Reconstruction, Novel View Synthesis, Depth Estimation, 3D Object Detection
Tools & Platforms	Git, Docker, Linux (Ubuntu), MATLAB, LaTeX

Honors & Awards

2026 **Highlight Paper,** EcoSplat, IEEE/CVF Conf. Comput. Vis. Pattern Recognit. (CVPR)

2026 **Outstanding Reviewer,** IEEE/CVF Conf. Comput. Vis. Pattern Recognit. (CVPR)

2022– **KAIST Graduate Program Scholarship,** Full tuition waiver and monthly living stipend — *KAIST*