

Radiant Landscapes: Painterly 3D Representations Using Gaussian Splatting

Marc-Eduard Ihle¹

¹UiT The Arctic University of Norway, Tromsø/Norway · marc.ihle@uit.no

Abstract: This paper explores 3D Gaussian Splatting (3DGS) as a method for artistic and analytical landscape representation, extending point clouds beyond geometric accuracy to convey painterly, volumetric, and immersive qualities of a site. Leveraging mobile-device capture, open-source 3DGS tools, and Blender-based visualization, the study demonstrates how dense vegetation, reflective surfaces, and subtle atmospheric effects can be represented – challenges that often exceed the capabilities of conventional LiDAR and Structure-from-Motion (SfM) methods. 3DGS encodes scenes as volumetric splats with color, opacity, and reflectivity attributes, producing renderings that are simultaneously impressionistic and photorealistic while enabling real-time navigation – even on modest hardware. The findings indicate that 3DGS transforms static 3D datasets into expressive, spatially coherent environments. It bridges traditional geometric documentation with perceptual and atmospheric insight.

Keywords: 3D Gaussian splatting, radiance-based modelling, immersive visualization, landscape representation

1 Introduction

1.1 Between the Objective and the Subjective: Radiance and Immersion

Perception of landscape operates across multiple scales. Observers focus on individual elements, such as plants or geological features, while simultaneously perceiving these elements as part of a broader relational field (SPUYBROEK 2014), embedded within a network of spatial, temporal, and atmospheric relationships. Immersion arises not from isolated objects, but from experiencing these interrelated qualities, forming a sense of wholeness.

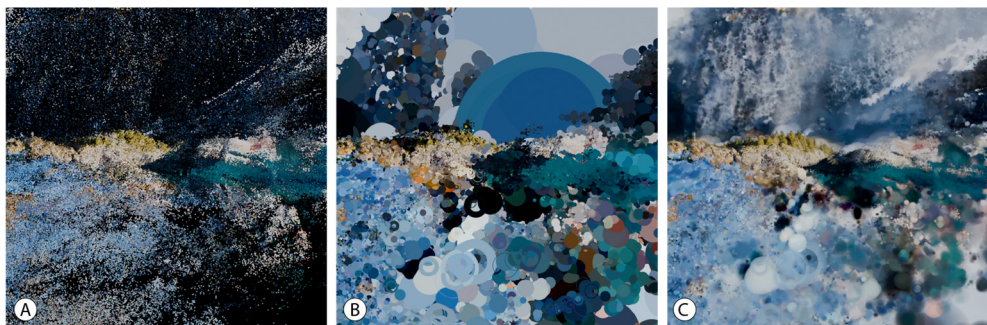


Fig. 1: Point cloud computed using 3DGS from UAV imagery, rendered with variance in color and (A) uniform radii, (B) non-uniform radii, (C) non-uniform radii and variance in opacity | Images, 3DGS data processing & visualization: Marc-Eduard Ihle

The notion of infinity – where background distance, sky, light, and atmospheric effects converge – is essential to creating immersive environments that engage the observer fully, allowing perception of spatial and material qualities beyond the purely visual.



Fig. 2: Nineteenth-century Romantic landscape painting: (A) *Wanderer Above the Sea of Fog*, oil on canvas, Hamburger Kunsthalle (FRIEDRICH 1818), (B) *The Spell of the Arctic*, oil on canvas, National Gallery, Oslo (BALKE 1870), (C) *Valley of Aosta Snowstorm, Avalanche and Thunderstorm*, oil on canvas, The Art Institute of Chicago (TURNER 1836)

Historically, representation of landscape has oscillated in its quality between measurable geometry and phenomenological experience. In ancient Greek and Roman practices, site assessment extended beyond topography and materials to include climate, orientation, and environmental suitability.



Fig. 3: *Motion of the Sea*: 30-second exposure capturing the flow, texture, and directional movement of the ocean | Foto: Marc-Eduard Ihle, 2017

Vitruvius, in *The Ten Books on Architecture* (VITRUVIUS 1914), emphasized that spatial quality arises not only from physical form but from the interactions of light, air, terrain, and human presence. Such relational criteria recognized the emergent, immersive qualities of place – an understanding later articulated as *Genius Loci*, or the spirit of place, which Christian Norberg-Schulz reframed as the perceptible, immaterial character of a site.

The nineteenth-century Romantic movement further amplified these atmospheric and relational dimensions. Artists such as Caspar David Friedrich, William Turner, and Peder Balke prioritized light, depth, and weather over strict topography, creating landscapes where form dissolved into radiance and immersive perception.

Photography and cinematography later extended these explorations, capturing time-based environmental forces – wind, water motion, cloud formation, and changing light – while maintaining immersive qualities akin to Romantic abstraction.

1.2 Beyond Objective Sensing and Representation

Documenting landscapes beyond strictly measurable criteria remains a challenge. Experiencing a site involves dynamic sensory and temporal qualities – light, wind, sound, seasonal change, and subtle relational interactions. Advances in radiance-based sensing, such as 3DGS, allow some of these visual environmental dynamics to be captured and digitally explored (YANG et al. 2024).

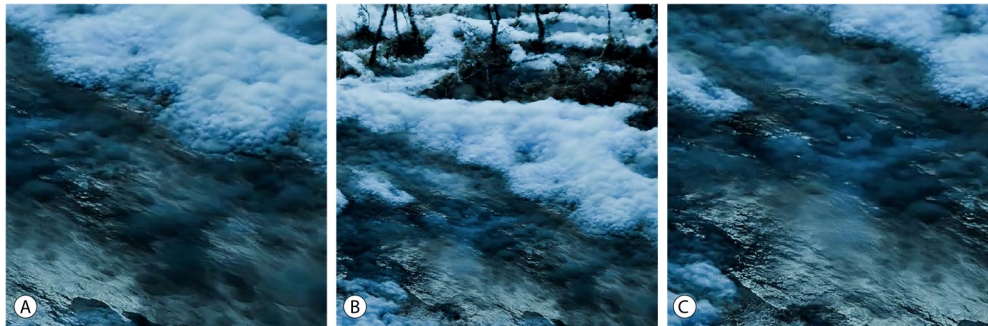


Fig. 4: Impressionistic representation of snow and slowly flowing meltwater, using 3D Gaussian Splatting (3DGS) to capture the granular texture of snow and the directional, blurred qualities of moving water | Student: Maja Broberg Røysland

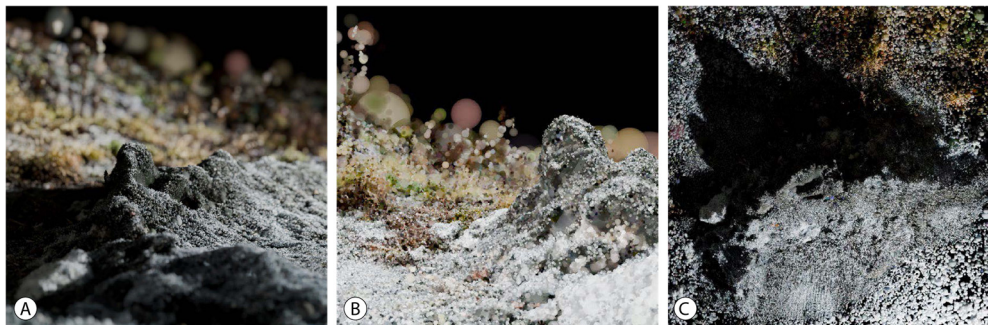


Fig. 5: Student Work: Close-up 3DGS renderings of urban snow in a parking lot, highlighting pollution and texture, (A) (B) perspective projections, (C) orthographic projection | Image: Hedvig Riiser Hegge

Repeated image capture from identical viewpoints at different times of day and across seasons allows representation not only of geometry but also of temporal variation and environmental transformation. Arctic environments, for instance, demonstrate extreme seasonal contrasts, profoundly altering light regimes, vegetation visibility, snow cover, and hydrological dynamics. Experiencing such conditions requires temporal depth as much as spatial accuracy, highlighting how landscape perception extends beyond static geometry.

Traditional surveying methods, including LiDAR and Structure-from-Motion (SfM), focus primarily on geometric precision, often excluding atmospheric, volumetric, and ephemeral qualities. Dense vegetation, reflective surfaces, and diffuse light scattering remain challenging, and resulting datasets can be computationally heavy, limiting interactive use in educational or participatory design contexts. Emerging radiance-based methods such as Neural Radiance Fields (NeRF) and 3D Gaussian Splatting (3DGS) address these limitations. In particular, 3DGS converts point clouds into volumetric splats encoding colour, opacity, reflectivity, and directional light, enabling immersive, painterly interpretations while preserving spatial fidelity. By integrating these approaches within the continuum of representational practices – from classical site description and Romantic atmospheric painting to photography – they expand digital surveying, bridging geometric accuracy with perceptual depth and temporal awareness.



Fig. 6: *Digital Pointillism*, 2016: Point cloud generated via Structure from Motion (SfM) using *Pix4D Mapper* and UAV imagery, (A) Mixed point clusters, (B) Low point density / overly close, (C) Sparse or missing points / too far | Data processing: GRID-IT GmbH, Innsbruck | Drone Images & Visualization: Marc-Eduard Ihle

2 Expanding Digital Surveying

2.1 Point Clouds from LiDAR

LiDAR (Light Detection and Ranging) has long been employed for high-precision landscape capture, merging scientific rigor with expressive potential (IVSIC et al. 2021, IVSIC et al. 2022). Applications such as *Gotthard Landscape: The Unexpected View* reveal both visible and hidden landscape layers (VOLLMER et al. 2023), while the *Kyoto Garden Dialogues* use point clouds as media for exploring intangible qualities (VOLLMER et al. 2023). LiDAR ex-

cells in geometric precision, providing accurate sub-canopy data and reliable structural representation. Another benefit of LiDAR – particularly when the emitted pulse senses beyond human vision, such as in the Near-Infrared (NIR) range around 1064 nm – is the ability to assess vegetation (IHLE et al. 2024) by computing indices such as the Normalized Difference Vegetation Index (NDVI) or other vegetational indices.

Despite these advantages, practical limitations persist. High-end LiDAR systems are expensive and often inaccessible to students or small research teams. Environmental factors such as rain, fog, or reflective surfaces produce noisy or incomplete data. LiDAR point clouds are data-intensive, requiring substantial storage and processing power, and density decreases with distance, reducing legibility in expansive landscapes. Equipment size and operational complexity further limit participation, especially in educational or collaborative contexts.

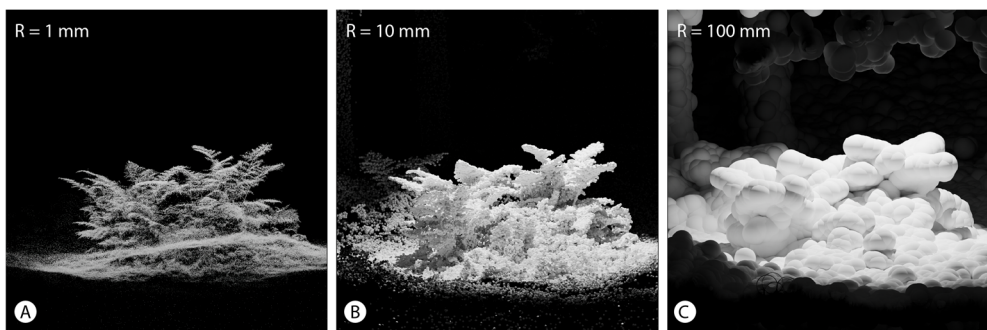


Fig. 7: Point cloud rendered with spheres with a uniform radius of (A) 1mm, (B) 10mm, (C) 100 mm | 3DGS scan & visualization: Marc-Eduard Ihle

2.2 Structure-from-Motion (SfM)

Structure-from-Motion (SfM) offers a low-cost alternative, producing 3D point clouds from RGB imagery captured by drones, handheld cameras, or mobile phones. It captures color and texture, generating visually rich models that approximate human perception. SfM is particularly effective on static, matte surfaces such as rocks or soil, often producing pointillistic or painterly effects (WESTOBY et al. 2011). However, SfM shares some limitations with LiDAR. Reflective or refractive surfaces often cause feature-matching failures, while dense vegetation and atmospheric effects remain challenging to capture. SfM point clouds are typically less volumetric, limiting immersive interpretation. Nevertheless, the accessibility, portability, and ease of use of SfM make it an important complement to traditional surveying, particularly in educational settings or rapid field assessments.

2.3 From Uniform Voxels to Non-Uniform Splats

Rendering point clouds as voxels or other primitive shapes improves visual continuity (KANZLER et al. 2018) (Figure 7) but remains limited in volumetric or perceptual fidelity (WESTOVER 1991). 3D Gaussian Splatting (3DGS) refines this approach by representing each point as a volumetric splat encoding position, size, scale- and colour variance, opacity, and

reflectivity. Unlike static voxels, splats blend more seamlessly, especially when opacity attributes are applied to create photorealistic yet painterly images. 3DGS overcomes challenges inherent to both LiDAR and SfM.

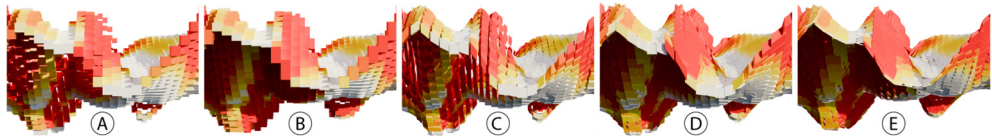


Fig. 8: Using *Geometry Nodes* and *Shader Nodes* in *Blender* to manipulate point centered geometry: A) Cube (Voxel) with uniform scaling along X, Y, and Z, B) Cuboid with non-uniform Z-scaling based on slope angle, C) Parallelepiped aligned perpendicular to the surface normal, D) Parallelepiped perpendicular to the surface normal, with non-uniform scaling in the X and Y directions, E) Parallelepiped perpendicular to the surface normal, scaled in X and Y, and subdivided using a Catmull-Clark algorithm – representing a “splat” | Visualization: Marc-Eduard Ihle

2.4 Opportunities for Landscape Representation and 3DGS

While 3DGS has seen growing use in fields like robotics, heritage documentation, and agriculture (CHEN et al. 2022, LI et al. 2025, YU et al. 2025, ZHAO et al. 2025) its application within Landscape Architecture still remains rather underexplored.

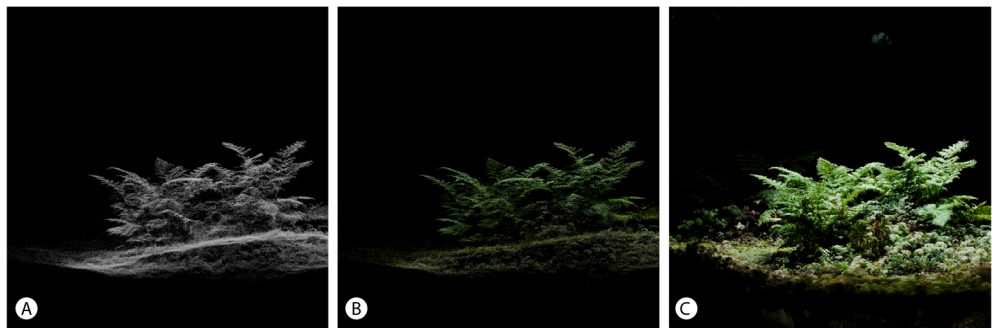


Fig. 9: Point cloud computed using 3D Gaussian Splatting (3DGS) and a mobile phone with an RGB camera: Point Cloud rendered with (A) uniform radii, (B) uniform radii and variance in color, (C) non-uniform radii and variance in color and opacity | Image: Marc-Eduard Ihle

2.5 Technical Overview

Table 1: Comparison of LiDAR, SfM, NeRF, and 3D Gaussian Splatting for Landscape Representation (ATIK 2025, PETROVSKA et al. 2025)

Criterion	LiDAR	SfM	NeRF	3DGS
Sensing Modality	Active	Passive	Passive	Passive
Data Source	Laser pulses	RGB Images	RGB Images	RGB Images
Vegetation Representation	Good capture of sub-canopy	No capture of sub-canopy	Partial capture of sub-canopy	Partial capture of sub-canopy
Reflective / Transparent Materials	Poor: scattering, noise, data gaps	Poor: feature matching fails	Good: view-dependent reflections modelled	Very good: preserves lighting and reflections
Atmospheric	Limited	Limited	Very good	Very good
Volumetric	Limited	Limited	Very good	Very good
Accuracy	Very high	High (surface-dependent)	Moderate (some artifacts)	Moderate-high (SfM-dependent)
Photorealism	Low	Moderate	Very high	Very high
Processing Speed	Slow	Moderate-slow	Slow (training)	Fast (training)
Render Speed	Slow	Slow	Moderate	Fast
Hardware (during field operations)	Specialized, heavy equipment	Low-end, light weight	Low-end, light weight	Low-end, light weight
Cost	High	Low	Low	Low
Storage Size	Very large	Moderate	Low	Moderate
In-situ Results	No	Limited	No	Yes
Artistic use	Low	Moderate	High	Very high
Educational use	Limited	Good	Limited	Very good

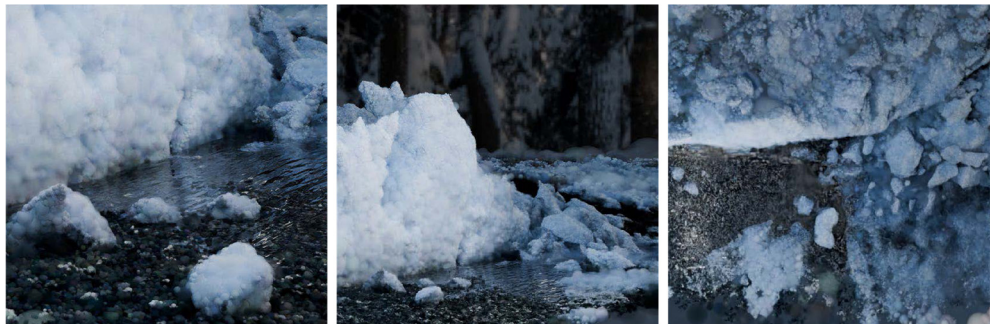


Fig. 10: Student Work: 3D Gaussian Splatting (3DGS) rendering depicting snow, ice, water, and gravel, with a perspective extending beyond the water onto the gravel surface | Image: Sofie Shuyang Bjarkø

3DGS represents landscapes as collections of Gaussian primitives iteratively optimized in position, scale, shape, colour, and opacity. Rendered collectively, these splats form continuous environments capable of Novel View Synthesis (NVS), supporting perspectives not limited to human viewpoints (SCHOB et al. 2023). Unlike NeRF, which relies on computationally intensive ray marching and implicit scene representation (BLANC et al. 2025), 3DGS uses

explicit primitives and rasterization-based rendering, enabling real-time performance even on low-end devices (KERBL et al. 2023).

Although resulting in larger storage sizes compared to NeRF, training and processing times are shorter, and interactive exploration remains responsive (KERBL et al. 2023). 3DGS thereby provides both analytical and artistic affordances.



Fig. 11: 3D Gaussian Splatting (3DGS) rendering of a forest floor, illustrating variations in splat size, color, and opacity under adjusted lighting conditions in *Blender* | 3DGS scan & visualization: Marc-Eduard Ihle

3 Methods

The methodological workflow for this study was structured into four interrelated stages, encompassing capture, processing, manipulation, and integration of 3D Gaussian Splatting (3DGS) datasets. The aim was to explore both technical and artistic potentials of the approach while supporting pedagogical applications, with outputs disseminated as video sequences and partially as immersive VR experiences.



Fig. 12: Student work: 3D Gaussian Splatting (3DGS) representation of a forest clearing, capturing snow-covered ground, mossy surfaces, and trees in the background | Image: Line Waal Gjøsteen

3.1 Generation of 3DGS Datasets

The first stage involved capturing images of landscapes using multiple acquisition strategies. Three types of image sources were tested: (1) frames extracted from video sequences, also referred to as Multi-View Stereo (MVS), (2) overlapping photographs captured with mobile phones using Structure-from-Motion (SfM) applications, specifically the *3D Scanner App*, and (3) manual photographs taken with a DSLR camera equipped with a 35mm lens.

These images were then processed through three computational workflows to generate point clouds: desktop-based *COLMAP*, the locally installed *Postshot* 3DGS application, and the mobile *Scaniverse* app, which computes 3DGS splats in real time during capture.

The outputs from these workflows were exported as .PLY files (Polygon File Format/Stanford Triangle Format), containing point cloud attributes such as position, colour, opacity, scale, rotation, and spherical harmonics coefficients. These attributes formed the foundation for further analysis, artistic manipulation, and immersive visualization.

3.2 Blender Integration and Scene Building

In the second stage, 3DGS datasets were imported into *Blender* for visualization and further manipulation. Two *Blender* add-ons were employed: the *3D Gaussian Splatting* add-on (RESHOTAI 2025), which visualizes splats as spheres with adjustable attributes, and the *3DGS Render* add-on (KIRI-INNOVATION 2025), which renders splats as planes while offering similar attribute variability.

The *3DGS Render* add-on offered more advanced functionality. However, its slower performance and complexity limited rapid experimentation, particularly in educational contexts. In both cases, *Geometry Nodes* and *Shader Nodes* were leveraged to manipulate splat attributes, including colour, size, orientation, and opacity, allowing for nuanced artistic and analytical control. *Blender*'s scene-building tools – lighting, depth of field, camera positioning, and modifiers – were then used to add individual interpretations.



Fig. 13: Student work: Still images extracted from a video sequence, Highlighting mushrooms on the humid floor of a spruce forest depicted using 3DGS | Image: Karolina Ciesluk

3.3 Node Trees and Splat Manipulation

The third stage emphasized the interpretive and educational potentials of 3DGS through the use of the pre-generated Node Trees by the add-ons mentioned above. These Node Trees allowed students to rapidly manipulate their scans without building complex node structures from scratch.

Shader Nodes complemented *Geometry Nodes*, enabling detailed control over transparency, colour blending, and material-like effects. By adjusting these parameters, students could enhance painterly, volumetric appearances creating renderings that were partly able to convey their emotional impressions experienced on site.



Fig. 14: Virtual Camera Settings: Altering the focal length (A) no f-stop, (B) f-stop 5.6, (C) F-stop 2.8 | 3DGS scan & visualization: Marc-Eduard Ihle

3.4 Immersive and Interactive Scene Construction

The final stage focused on constructing interactive and dynamic 3D landscape scenes. Students adjusted camera positions, focal lengths, lighting conditions, and environmental parameters in real time. The workflow enabled exploration from multiple perspectives, including novel and orthographic viewpoints that would not be possible with conventional photography or LiDAR capture.

In addition to still images, each student produced a 30-second video sequence incorporating animated camera movements. These sequences explored spatial transitions beyond typical human viewpoints, ranging from top-down orthographic projections to close-up zooms.

4 Results

Student workshops indicated that 3D Gaussian Splatting (3DGS) can be adopted relatively quickly, even by participants with limited or no prior experience in advanced visualization tools. Real-time interaction supported iterative experimentation and immediate evaluation of adjustments, which appeared to encourage sustained engagement. While the degree of interest varied among participants, most were able to produce coherent and navigable spatial reconstructions within a short timeframe.

When navigating their reconstructed digital environments, students generally reported a more intuitive perception of spatial depth compared to previous groups of students and explorations of traditional point-cloud viewers such as those found in GIS applications like *SagaGIS* or point-cloud editing software such as *CloudCompare*. The volumetric continuity of splats seemed to enhance spatial legibility and immersion, supporting a clearer understanding of relationships within the scene.

4.1 Capturing Vegetation and Reflective Surfaces

3DGS excelled particularly in photorealistic rendering of dense vegetation, including leaf- and stem-level complexity, canopy density, and atmospheric depth cues. Reflective surfaces especially characteristic of alpine and arctic winter environments – water, ice, snow – were represented continuously, overcoming scattering artifacts common in LiDAR and SfM. Volumetric depth and transparency allowed the visualization of diffuse or distant elements such as fog, open sky, or snowfields. This volumetric approach enabled a more holistic understanding of landscape structure, integrating near- and far-field elements in a perceptually coherent environment. Combined with NVS, users could explore landscapes from orthographic and unconventional perspectives, enhancing analytical and experiential comprehension.

4.2 Interpretive and Artistic Dimensions

As outlined in the introduction, 3DGS supports both analytical and artistic exploration by encoding volumetric, perceptual, and spatial qualities, which, in this study, enabled students to produce immersive renderings exploring these dual potentials.

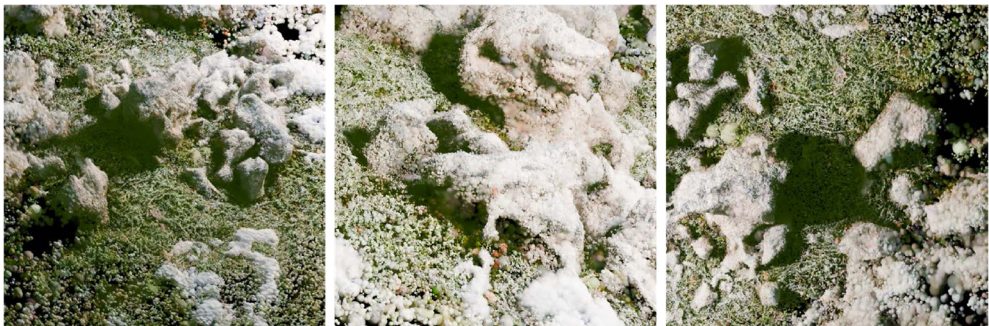


Fig. 15: Student Work: 3DGS-based artistic representation of snow clusters forming within a marsh landscape | Image: Wattana Meethong

5 Towards Radiant Landscape Twins

The concept of the Digital Twin (DT) has been interpreted in multiple ways across disciplines (ABDELRAHMAN et al. 2025). In this paper, *Radiant Landscape Twins* are understood as landscape-specific digital twins generated through 3D Gaussian Splatting (3DGS), designed to integrate structural, perceptual, and atmospheric qualities within spatial-temporal, radiance-based environments.

Unlike conventional photogrammetry or LiDAR workflows, 3DGS retains phenomena typically treated as noise – such as fog, rain, snowfall, or distant sky conditions – while preserving spatial coherence. As a result, these twins function not merely as accurate geometric replicas but as dynamic, modifiable environments for analysis, design exploration, and narrative representation, enabling both analytical rigor and creative engagement.

Radiance encoding allows for nuanced depiction of colour, depth, and light scattering, bridging a gap between measured data and human perceptual experience. *Radiant Landscape Twins* thus facilitate immersive pedagogy, participatory design, and remote sensing applications, enabling exploration and understanding of environmental qualities that would otherwise require physical presence.

6 Discussion and Conclusion

6.1 Comparative Positioning

Compared to LiDAR and Structure-from-Motion (SfM), 3D Gaussian Splatting (3DGS) integrates volumetric rendering with real-time responsiveness. LiDAR remains superior for precise terrain mapping and vegetation penetration, while SfM continues to provide a valuable low-cost approach to photogrammetric reconstruction. Neural Radiance Fields (NeRFs) offer very high visual fidelity but typically require intensive computational resources and lengthy training times (ATIK 2025, BLANC et al. 2025).

3DGS occupies a middle ground, combining photorealistic rendering, volumetric encoding, and interactive efficiency (KERBL et al. 2023, YU et al. 2025). This balance of accessibility and expressive potential makes the technique particularly suitable for pedagogical environments. During the scanning phase, mobile workflows – especially those using smartphone applications such as *Scaniverse* – proved highly accessible, requiring minimal familiarization and enabling all students to participate actively in fieldwork.

Similarly, the subsequent digital design process using visual programming tools such as *Blender* and its node-based interface (IHLE et al. 2024) was comparatively easy for students to adopt, particularly when contrasted with the more technical user interfaces of less visually oriented software applications.

6.2 Outlook

Future developments may incorporate AI-assisted extrapolation, enhanced novel-view synthesis, and expanded multisensory data encoding (BLANC et al. 2025, YANG et al. 2024). As radiance-based modeling techniques mature, *Radiant Landscape Twins* could evolve into interactive research environments.

Augmented Reality (AR) could extend temporal awareness by overlaying seasonal or hypothetical conditions onto a site – for example, visualizing winter landscapes during summer, thus enabling a “digital landscape laboratory” for examining ecological processes, seasonal change, and potential climate impacts (VERSTRAETE et al. 2025).

Such frameworks may also open possibilities for more immersive and interpretive forms of conveying environmental evidence. By integrating data beyond the visible spectrum – such

as Near-Infrared (NIR) for vegetation analysis or Thermal Infrared for surface temperature patterns – these models could make otherwise intangible or non-visible processes more perceptible to stakeholders and decision-makers. In this way, spectral, seasonal, and climatic variations might be experienced spatially rather than solely interpreted through abstract diagrams or datasets.

This approach may prove particularly valuable in communicating conditions in remote or less accessible regions, including high Arctic landscapes or even extraterrestrial environments. Echoing Susan Schuppli's notion of "earth evidence," radiance-based twins might offer new ways of situating environmental data within experiential contexts. Such representations could potentially support more empathetic engagement with climate change scenarios and projected future impacts, complementing conventional quantitative forms of analysis rather than replacing them.

References

- ABDELRAHMAN, M., MACATULAD, E., LEI, B., QUINTANA ROSALES, M. A., MILLER, C. & BILJECKI, F. (2025), What Is a Digital Twin Anyway? Deriving the Definition for the Built Environment from over 15,000 Scientific Publications. *Building and Environment*, 274.
- ATIK, M. E. (2025), Comparative Assessment of Neural Radiance Fields and 3D Gaussian Splatting for Point Cloud Generation from UAV Imagery. *Sensors* 25 (10), 2995.
- BALKE, P. (1870), *The Spell of the Arctic*. Oslo, Norway, National Gallery.
- BLANC, H., DESCHAUD, J.-E. & PALJIC, A. (2025), Raygaussx: Accelerating Gaussian-Based Ray Marching for Real-Time and High-Quality Novel View Synthesis. *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), IEEE/CVF*.
- CHEN, K. W., JANSSEN, P., AVIV, D., NINSALAM, Y. & MEGGERS, F. (2022), A Framework for Considering the Use of Computational Design Technologies in the Built Environment Design Process. *Global Journal of Engineering and Technology Advances*, 27, 1010-1027.
- FRIEDRICH, C. D. (1818), *Wanderer above the Sea of Fog*.
- IHLE, M.-E. & WICHMANN, V. (2024), Blurring Boundaries between Scientific and Artistic Representation of Landscapes. *Journal of Digital Landscape Architecture*, 9, 253-266.
- IVSIC, L., RAJCIC, N., MCCORMACK, J. & DZIEKAN, V. (2022), The Art of Point Clouds: 3D LiDAR Scanning and Photogrammetry in Science & Art. *Proceedings of the 10th International Conference on Digital and Interactive Arts*, Article No. 55, 1-8. Association for Computing Machinery, Aveiro, Portugal.
- KANZLER, M., RAUTENHAUS, M. & WESTERMANN, R. (2018), A Voxel-Based Rendering Pipeline for Large 3d Line Sets. *IEEE Transactions on Visualization and Computer Graphics*, 25.
- KERBL, B., KOPANAS, G., LEIMKÜHLER, T. & DRETTAKIS, G. (2023), 3D Gaussian Splatting for Real-Time Radiance Field Rendering. *ACM Transactions on Graphics*, 42 (4), 139-139.
- KIRI-INNOVATION (2025), *3dgs Render Blender Add-On*.
- LI, J., HUANG, Q., XIN, W., XI, B., DUAN, J., YIN, H. & LINGYA, L. (2025), A Method for the 3D Reconstruction of Landscape Trees in the Leafless Stage. *Remote Sensing*, 17, 1473.

- PETROVSKA, I. & JUTZI, B. (2025), Seeing Beyond Vegetation: A Comparative Occlusion Analysis between Multi-View Stereo, Neural Radiance Fields and Gaussian Splatting for 3D Reconstruction. ISPRS Open Journal of Photogrammetry and Remote Sensing 16 (2667-3932), 100089.
- RESHOT AI (2025), Gaussian Splatting Blender Add-On.
- SCHOB, M. & REKITTKE, J. (2023), Neural Radiance Fields for Landscape Architecture. Journal of Digital Landscape Architecture, 8, 428-442.
- SPUYBROEK, L. (2014), Charis and Radiance: The Ontological Dimensions of Beauty.
- TURNER, J. M. W. (1836), Valley of Aosta: Snowstorm, Avalanche and Thunderstorm, Chicago, Art Institute of Chicago.
- VERSTRAETE, E. L., KUO, S., ADAMS, N. & ZACHWIEJA, A. J. (2025), Embodying the Impact of Climate Change for Decision Makers Using Augmented Reality (Ar): A Case Study of Climate-Threatened Cultural Heritage Sites in Western Alaska. Environmental Science & Policy, 171, 104178.
- VITRUVIUS (1914), Ten Books on Architecture. Harvard University Press, London, Humphrey Milford, Oxford University Press.
- VOLLMER, M. & HÄUSLER, D. (2023), Kyoto Garden Dialogues. Pamphlet (27).
- VOLLMER, M. & REBSAMEN, J. (2023), Gotthard Infrastructural Landscape. Pamphlet (27).
- WESTOBY, M., GLASSER, N., BRASINGTON, J., HAMBREY, M. & REYNOLDS, J. (2011), 'Structure-from-Motion': A High Resolution, Low-Cost Photogrammetric Tool for Geoscience Applications. AGU Fall Meeting Abstracts, 8.
- WESTOVER, L. (1991), Splatting: A Parallel, Feed-Forward Volume Rendering Algorithm.
- YANG, Y., HU, S., WU, H., BALDRICH, R., SAMARAS, D. & VANRELL, M. (2024), Mli-Nerf: Multi-Light Intrinsic-Aware Neural Radiance Fields. arXiv:2411.17235, <https://arxiv.org/abs/2411.17235>.
- YU, Y., VERBREE, E., OOSTEROM, P. & POTTGIESSER, U. (2025), 3D Gaussian Splatting for Modern Architectural Heritage: Integrating Uav-Based Data Acquisition and Advanced Photorealistic 3D Techniques. AGILE: GIScience Series, 6, 1-9.
- ZHAO, P., LI, C., JIANG, J., CHEN, L. & WANG, X. (2025), A Novel Framework Utilizing 3D Gaussian Splatting to Construct Building Geometry for Urban Wind Simulations. Sustainable Cities and Society, 123, 106237.