Semantics-Controlled Gaussian Splatting for Outdoor Scene Reconstruction and Rendering in Virtual Reality

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Edit Scene and Add Dynamics

Static Reconstruction

Added Water Dynamics
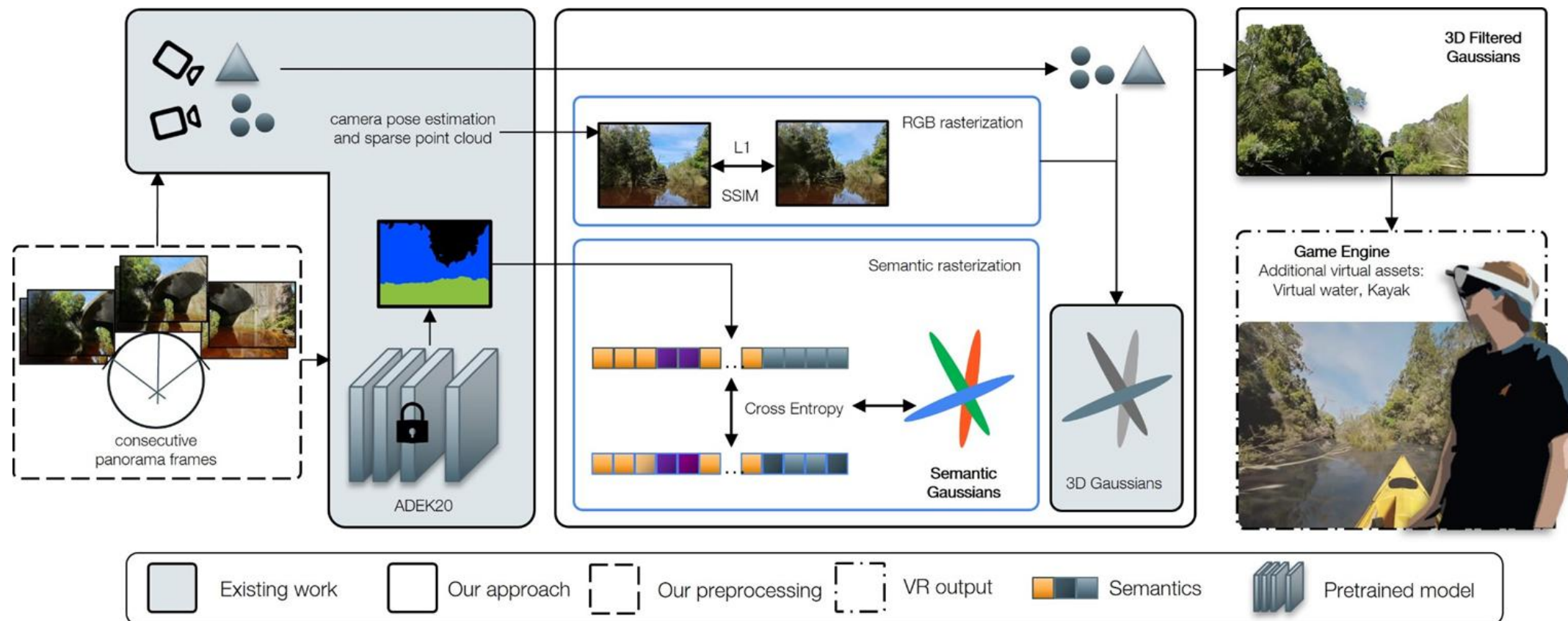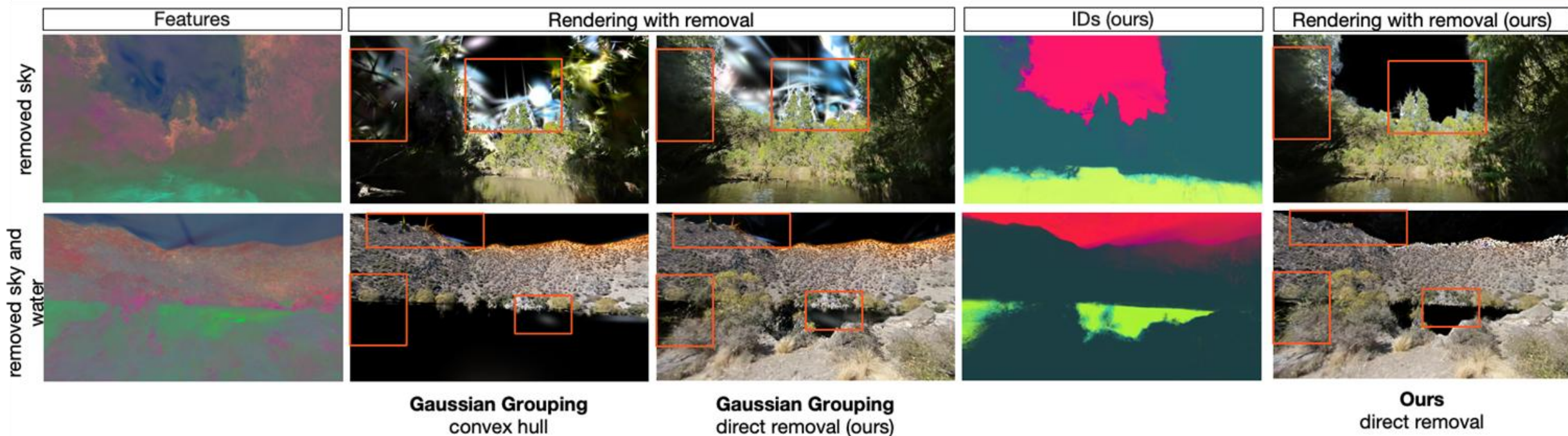
Added Sky

Static Reconstruction

Kerbl, B., Kopanas, G., Leimkühler, T., & Drettakis, G. (2023). 3d gaussian splatting for real-time radiance field rendering. *ACM Trans. Graph.*, *42*(4), 139-1.

Method

Removal

Ye, M., Danelljan, M., Yu, F., & Ke, L. (2024, September). Gaussian grouping: Segment and edit anything in 3d scenes. In *European Conference on Computer Vision* (pp. 162-179). Cham: Springer Nature Switzerland.
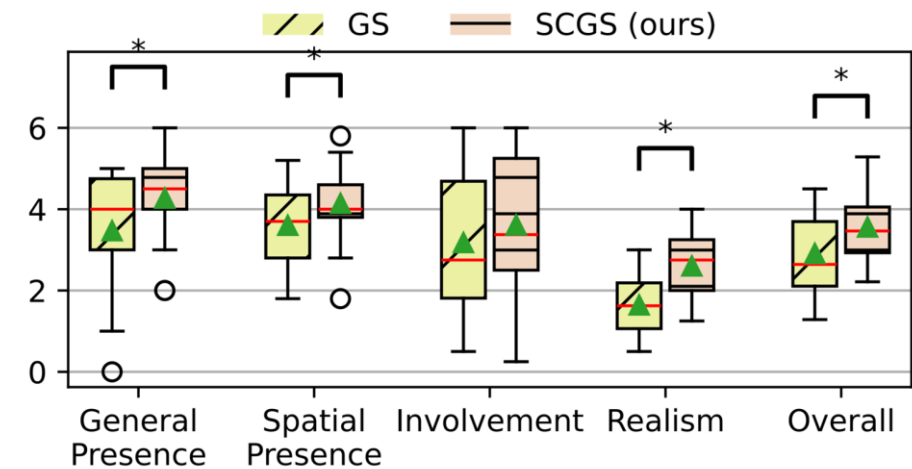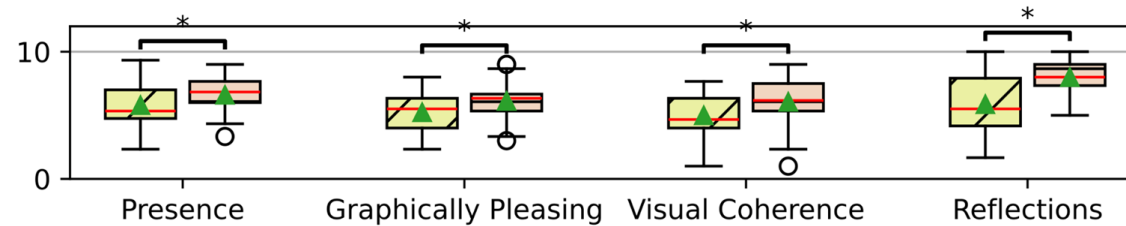
User Study

Pilot Study
24 participants (*14* male, *9* female, *1* non-binary),
22.42 +/- 4.93 years old

Main Study
30 participants (*16* male, *14* female, *0* non-binary),
26.97 +/- 3.37 years old

Conclusion

Gaussian Splatting in VR
Novel 3D Asset
Generation Approach

**Challenging novel view
synthesis Dataset**
New Challenging Outdoor Dataset
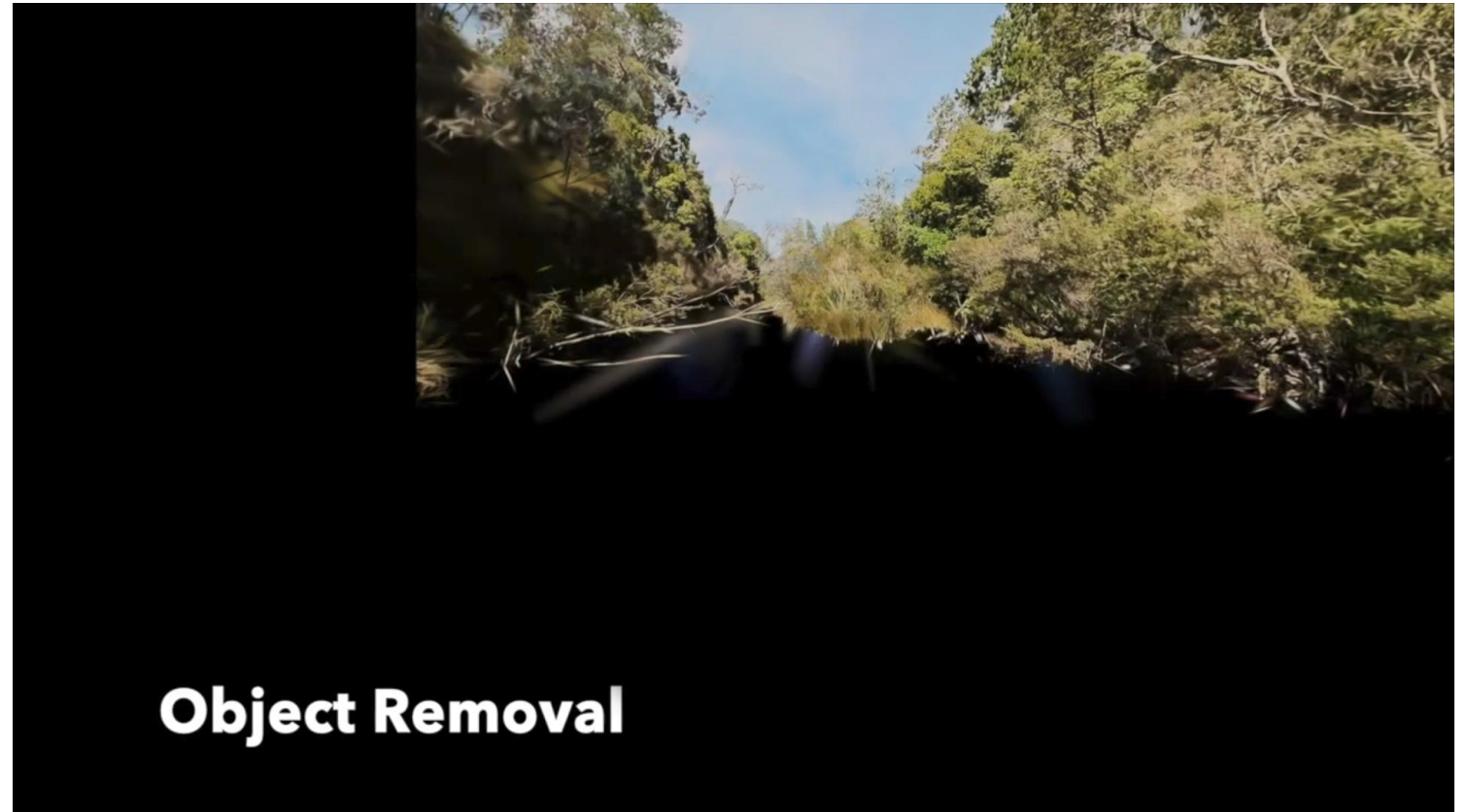
First user study on GS
User Study on Presence and
Quality

**Technical evaluation
on multiple datasets**
Technical Superiority in
Scene Editing

Showcasing multiple scenarios
Broad Applicability

Object Removal

Thank you for your attention!

Project:
Semantics-Controlled Gaussian Splatting for Outdoor Scene Reconstruction and Rendering in Virtual Reality

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https://hex-lab.io

https://hannahhaensen.github.io

Dataset:
https://osf.io/s9uvy/?view_only=eff198d8752840e69a9f2b8c1c
10b0a0