



Overview

Background

UCSB has no immersive viewer of campus. Google Earth has 360° views, but only along the streets at particular locations. GoGaucho provides classroom search features, but lacks visual context and is only available in the birds-eye projection. Students often get lost during their first days on campus and have to spend time and money to have physical tours of the campus.

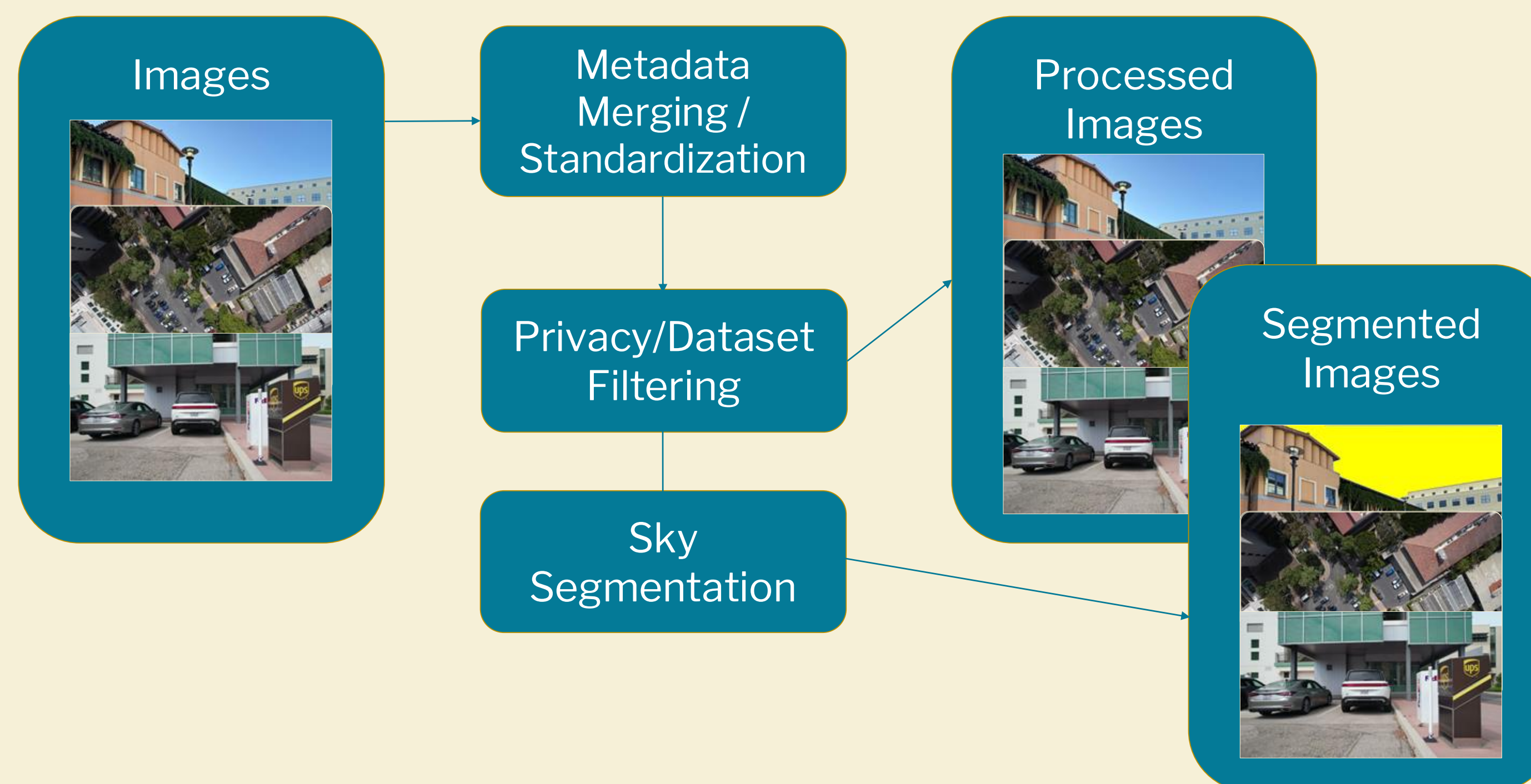
Our Solution

VistaVisio delivers an immersive, spatially-accurate 3D model of UCSB campus, enabling users to explore and navigate the environment as if there actually there. This can be achieved either in a web browser or through virtual reality, such as an Apple Vision Pro. By preserving both visual fidelity and real-world scale aligned with geographic coordinates, our platform provides an immersive experience that traditional media cannot capture, allowing students, professors, or visitors anywhere at anytime view our campus.

Data Collection

Privacy & Metadata Filtering

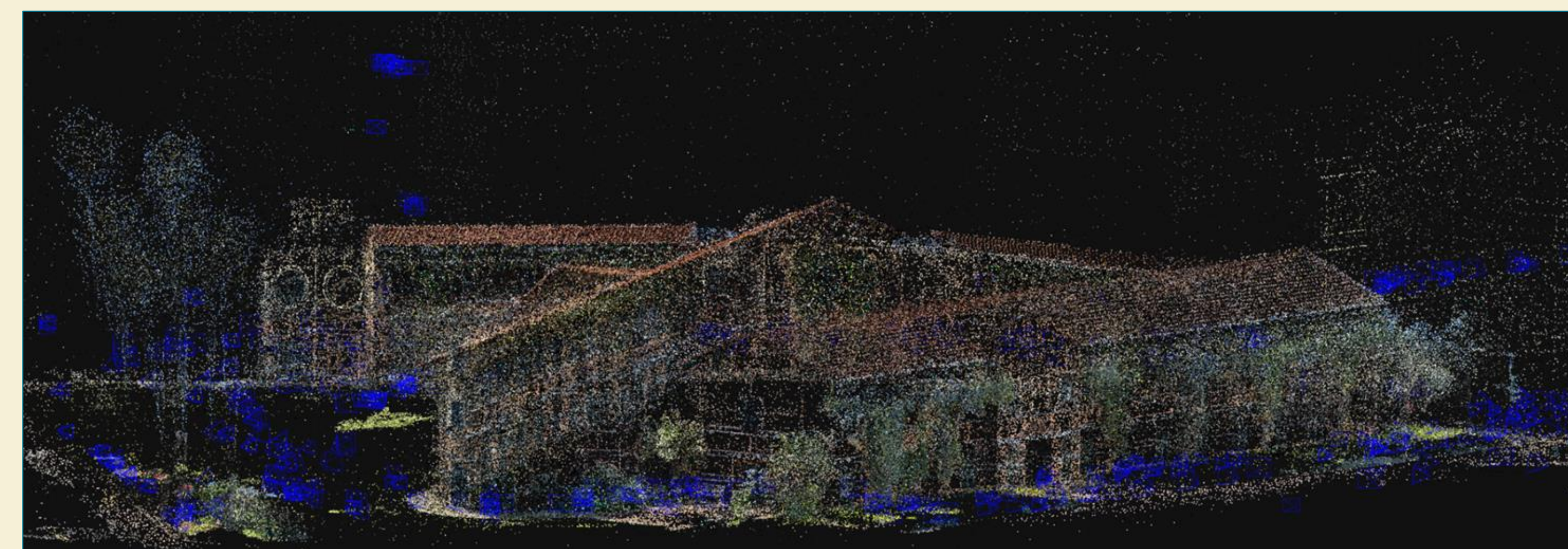
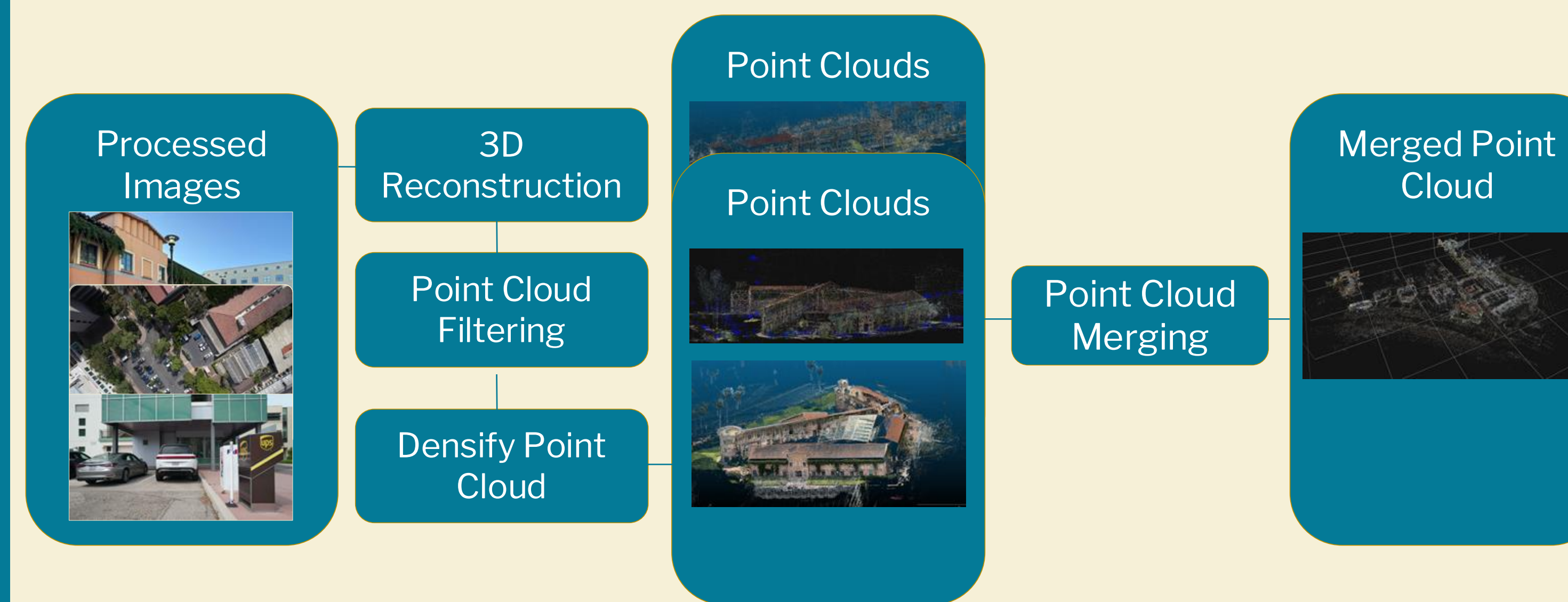
Ten of thousands of images are captured using mobile phones and drones. Centimeter-level GPS metadata from EMLID Rx2 devices ensures precise geospatial alignment. YOLO-based pipelines automatically anonymize faces and license plates for ethical data handling.



3D Reconstruction

Structure From Motion

Structure-from-Motion (SfM) via COLMAP estimates camera poses and creates a sparse point cloud. After filtering and densification, we merge point clouds together to yield a dense point of regions of campus.



Sparse Point Cloud of Kavli Institute of Theoretical Physics

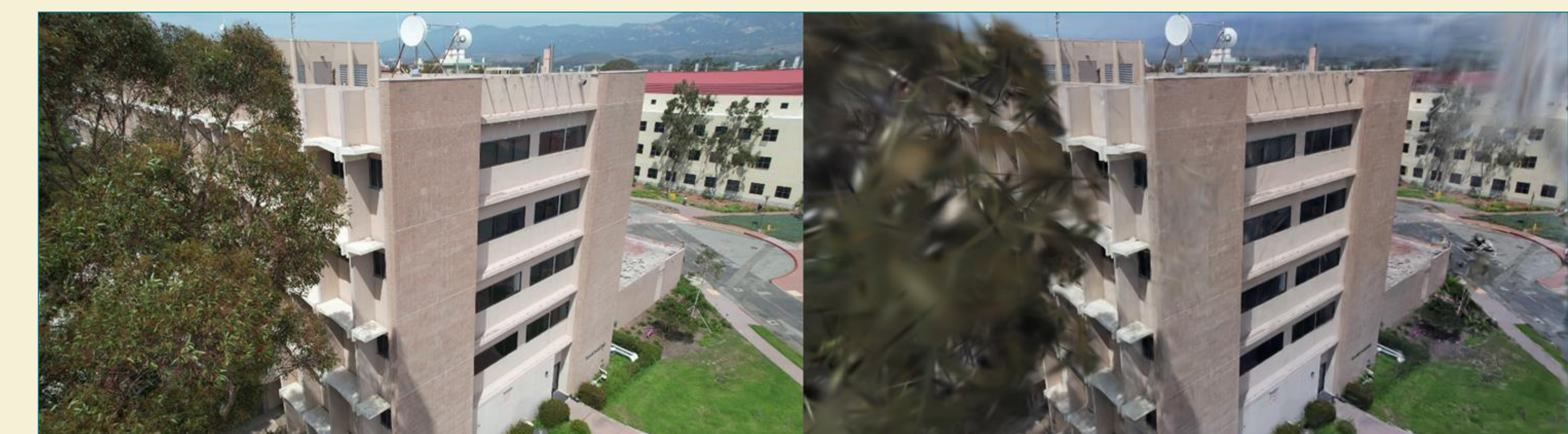
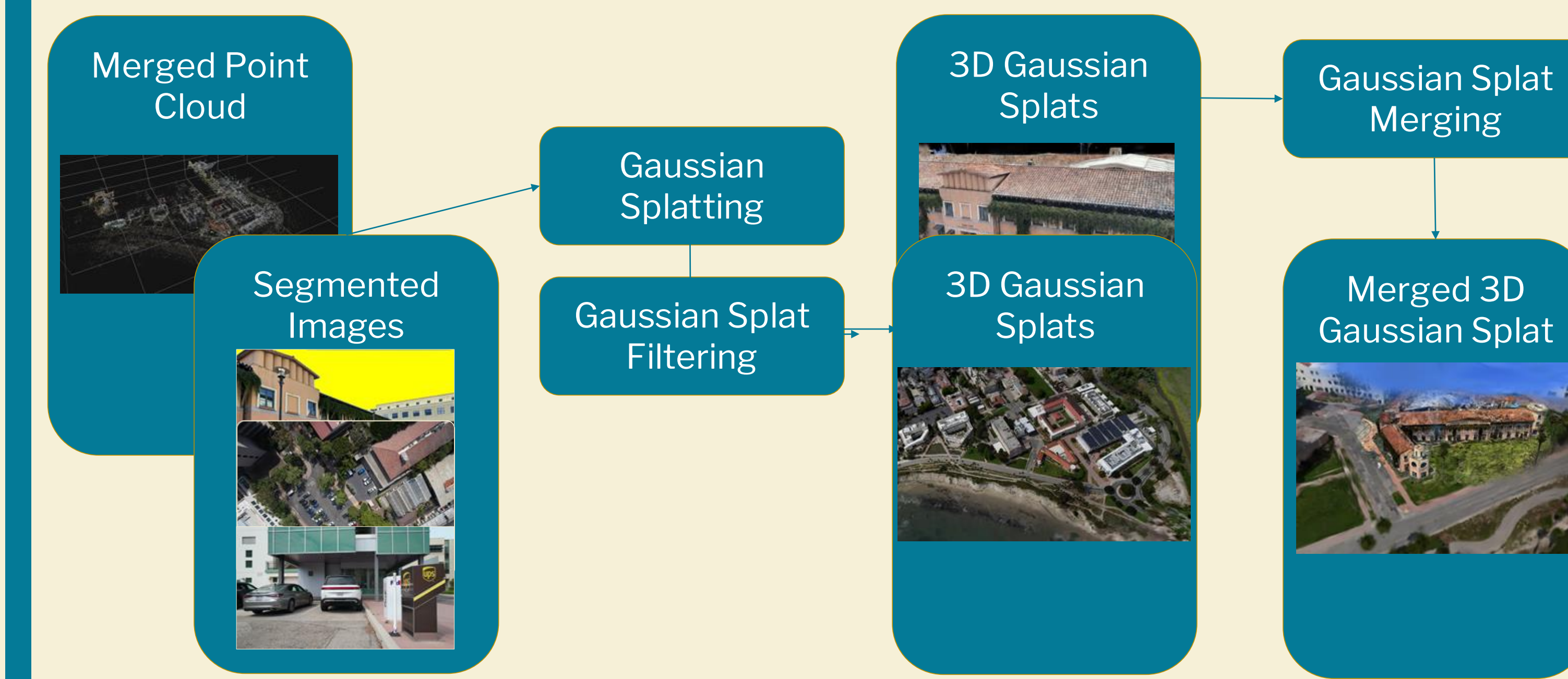


Dense Point Cloud of Drone Flight Path around the Lagoon

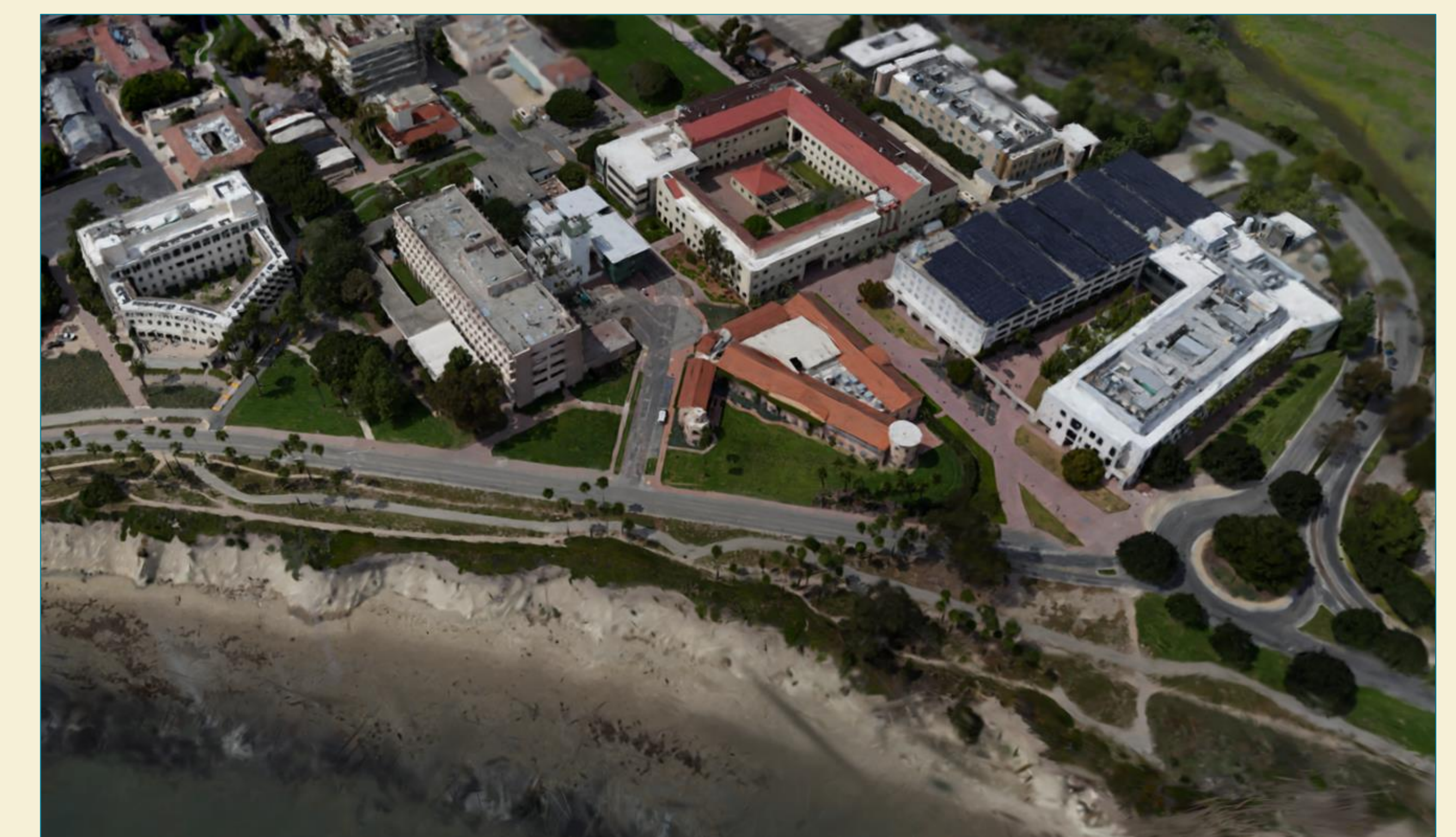
3D Gaussian Splatting

Photorealistic view

Gaussian Splatting then transforms these point clouds into photorealistic, view-consistent 3D assets by optimizing millions of tiny semi-transparent "splats". We then merge Gaussian Splats of regions of campus to yield an entire splat of campus.



Ground Truth (Left) v.s. Projection of Splat (Right) of HFH



Gaussian Splat of Drone Flight Path of East Side of Campus

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