RAPTER: Abstracting Man-made Scenes with Regular Arrangements of Planes

Supplementary materials
High-resolution renderings

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Euler

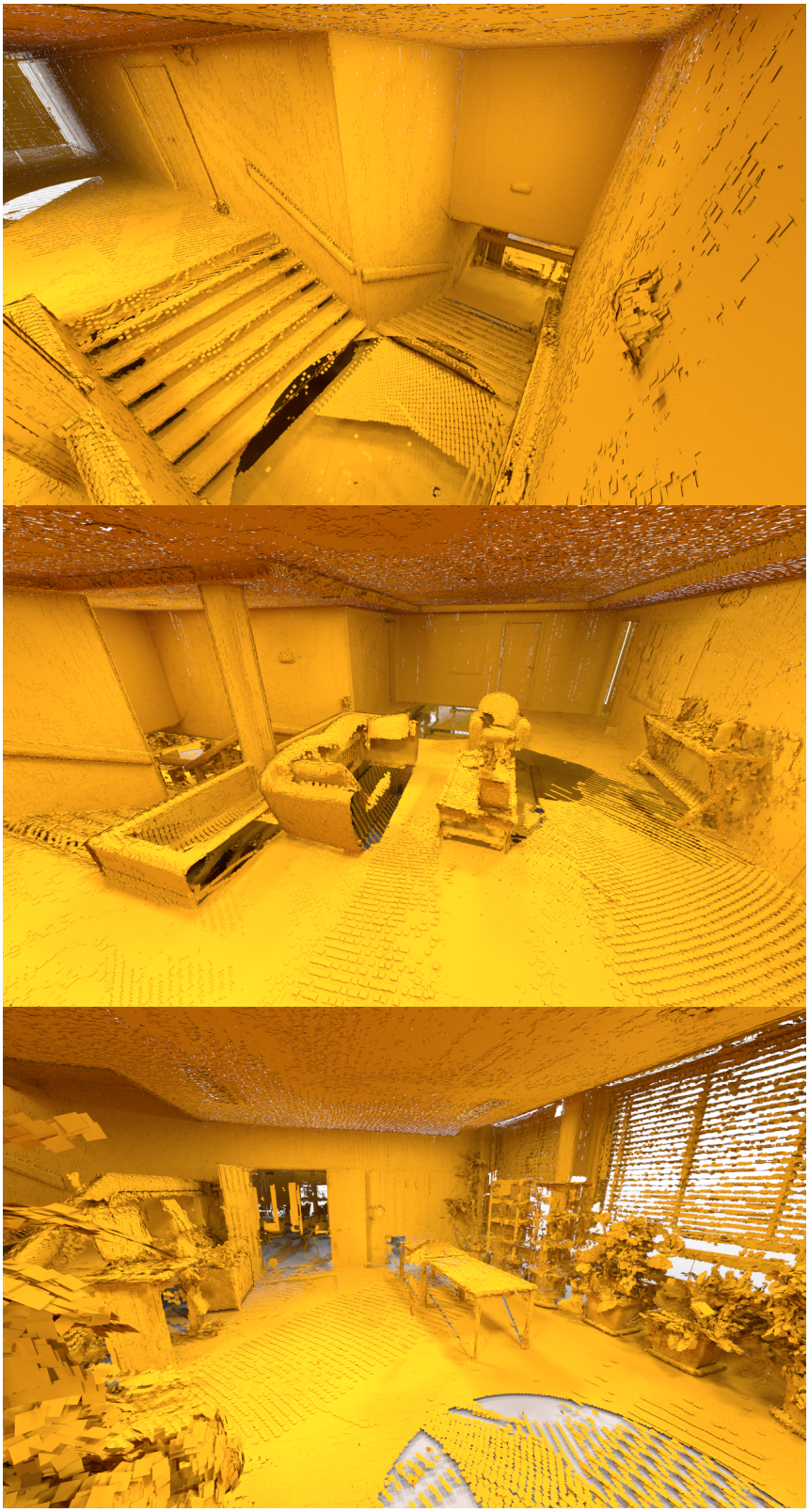

Figure 1: *Euler (teaser): Input (inside)*

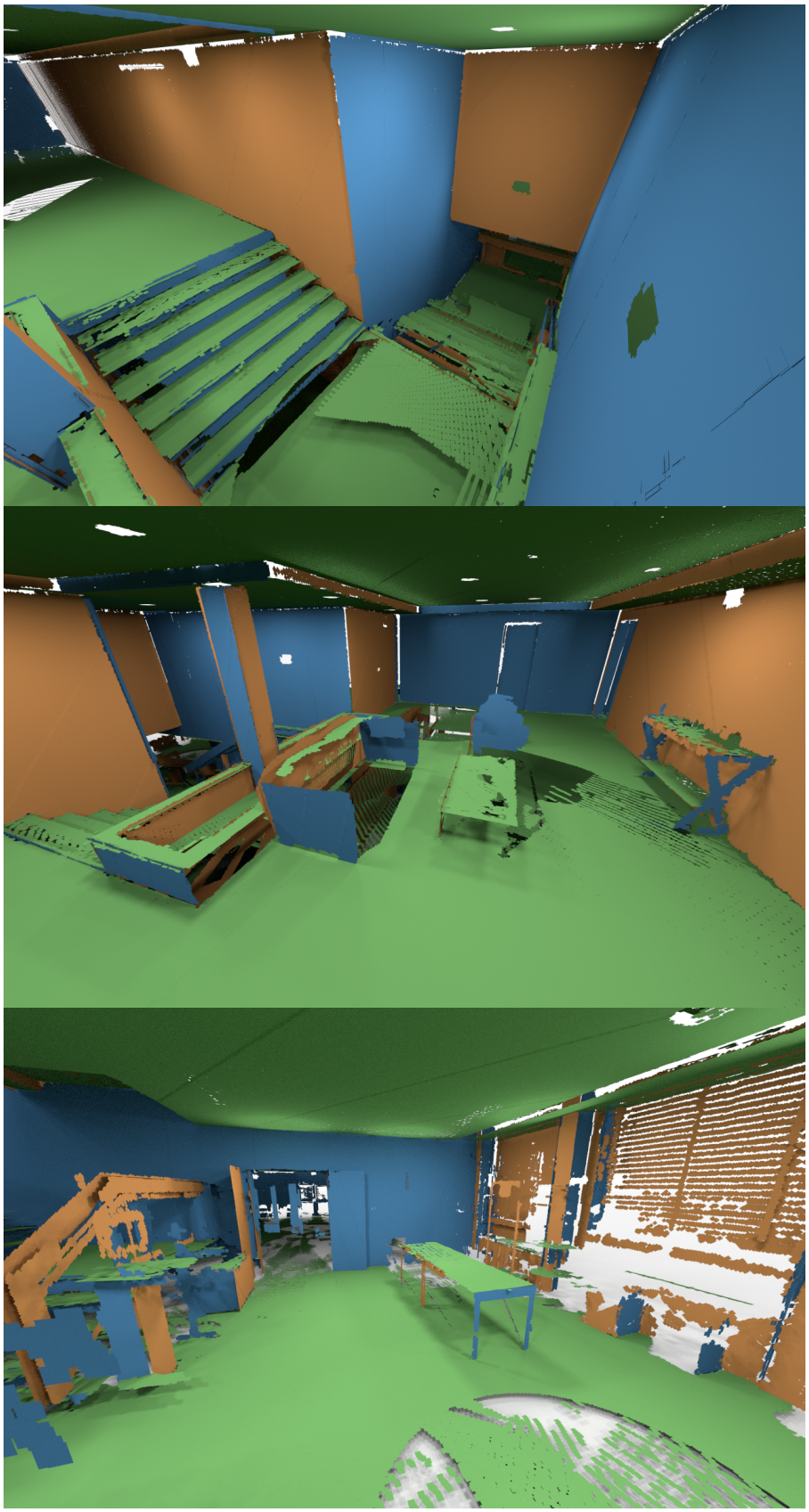

Figure 2: *Euler (teaser),* RAPTER*: Output (inside)*

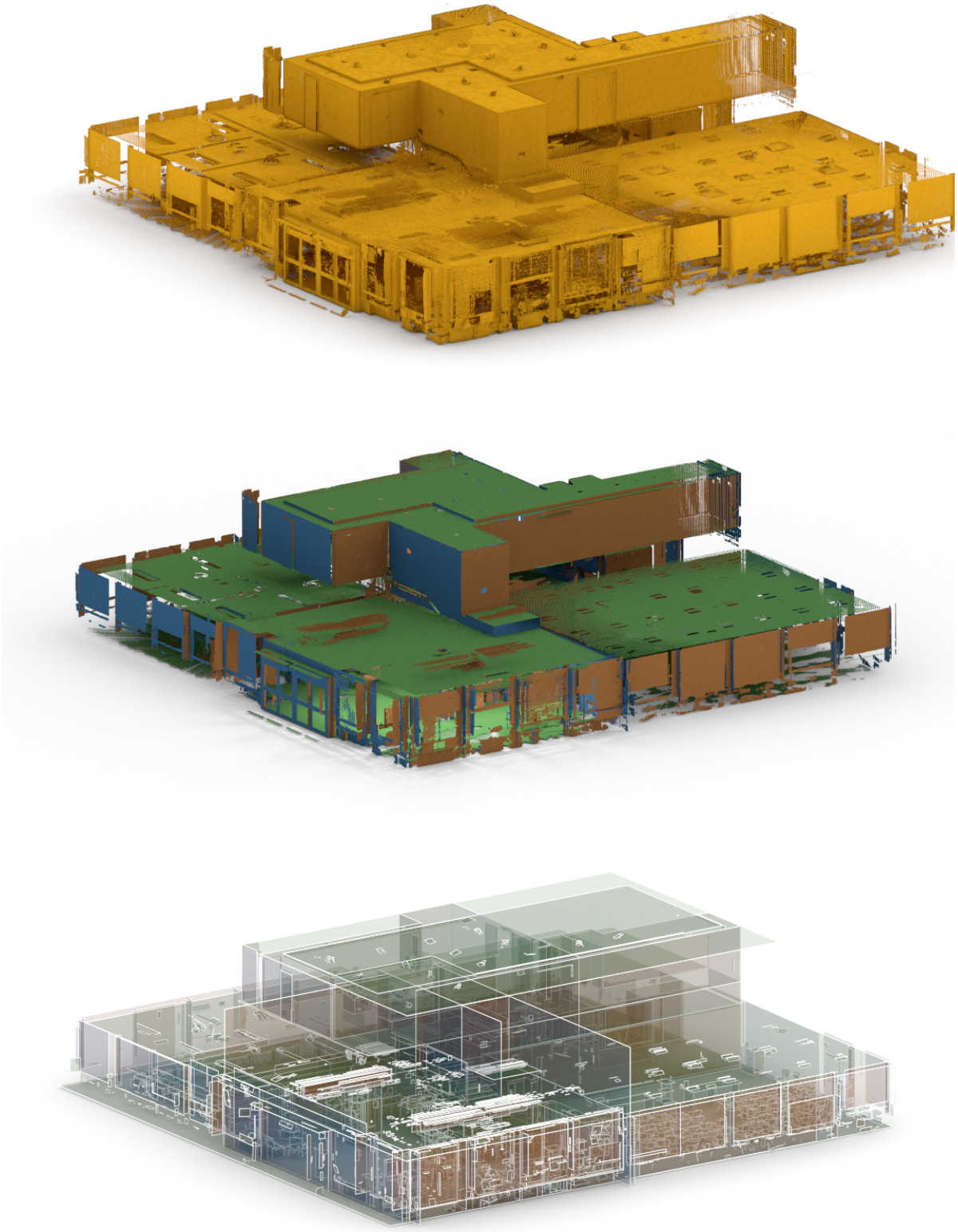

Figure 3: *Euler (teaser),* RAPTER*: Outside views. From top to bottom: input cloud, reprojected cloud, planar polygons.*

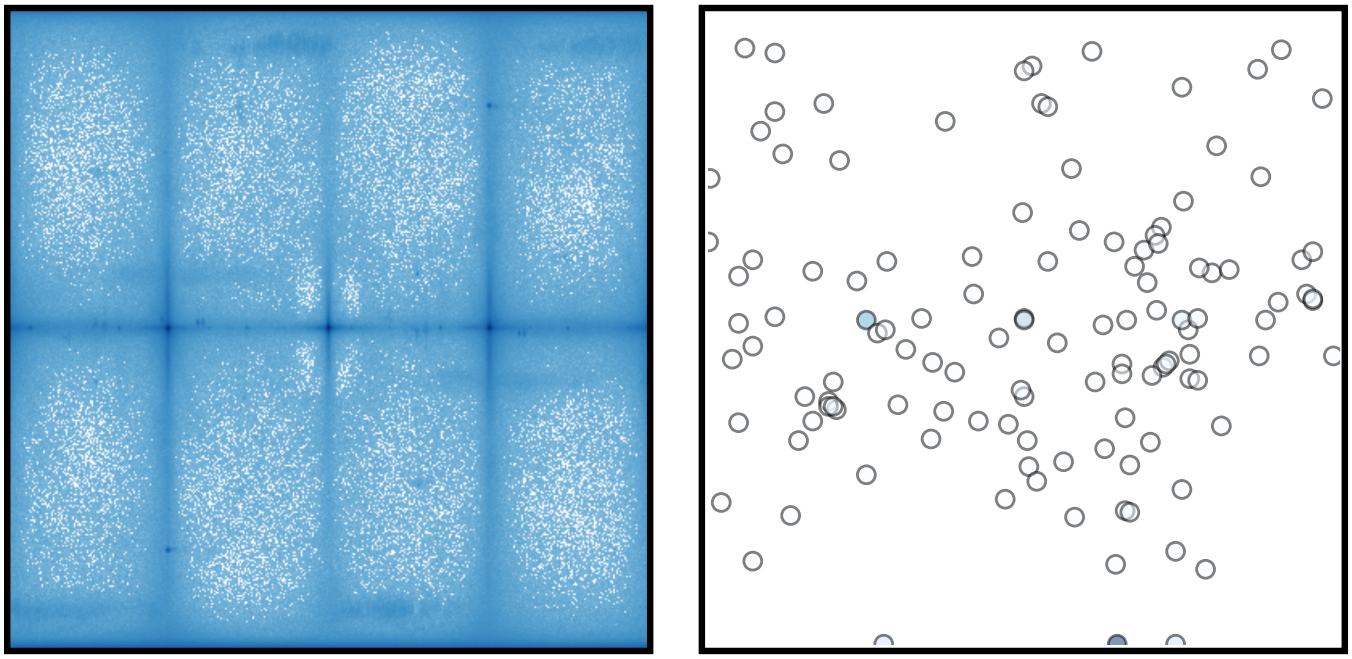

Figure 4: *Euler (teaser),* RAPTER*: Input and output distributions.*

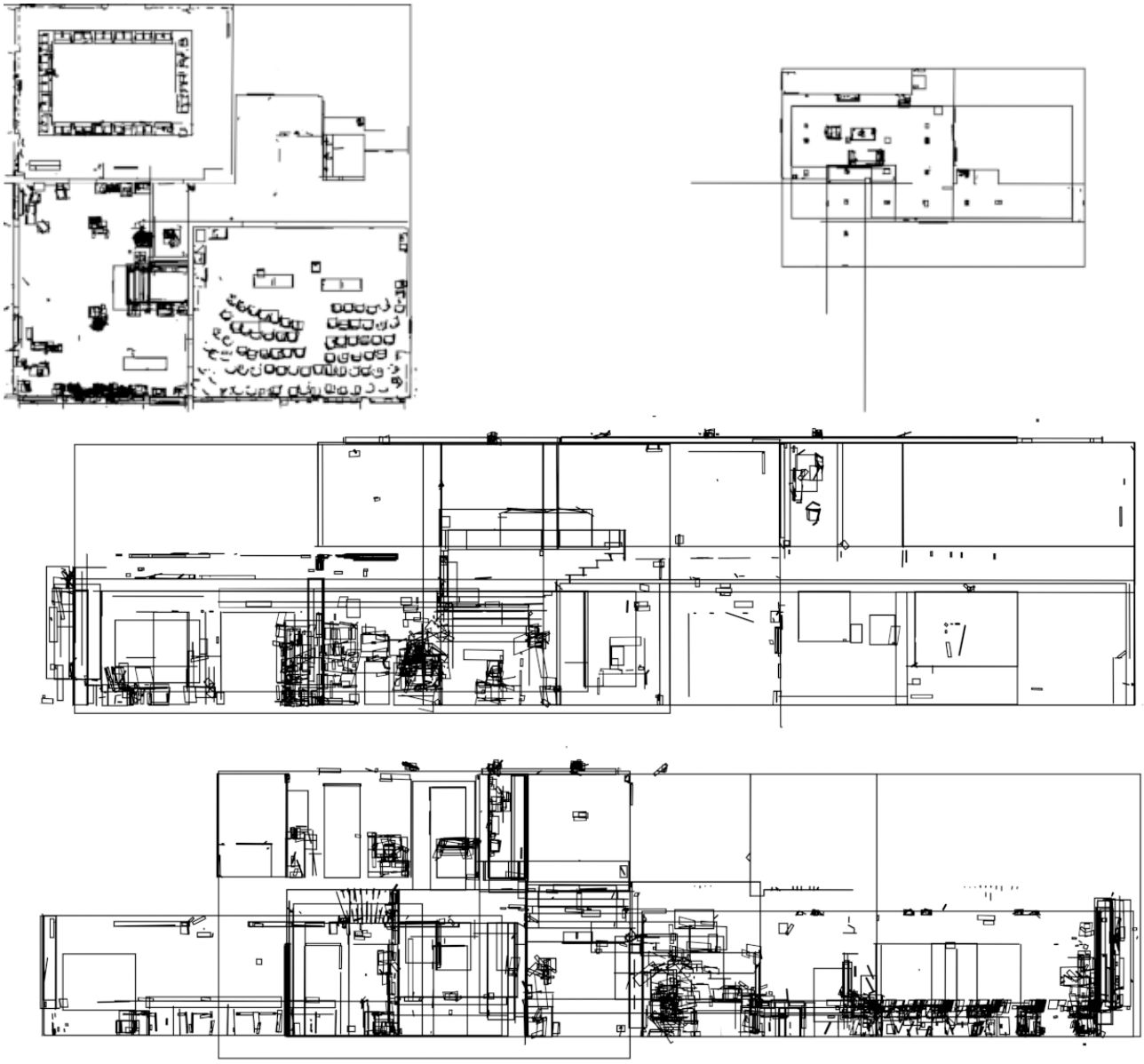

Figure 5: *Euler (teaser),* RAPTER*: Cross-sectional views reveal discovered regularity of the extracted arrangement at multiple scales, e.g., walls, stairways, chairs, etc*

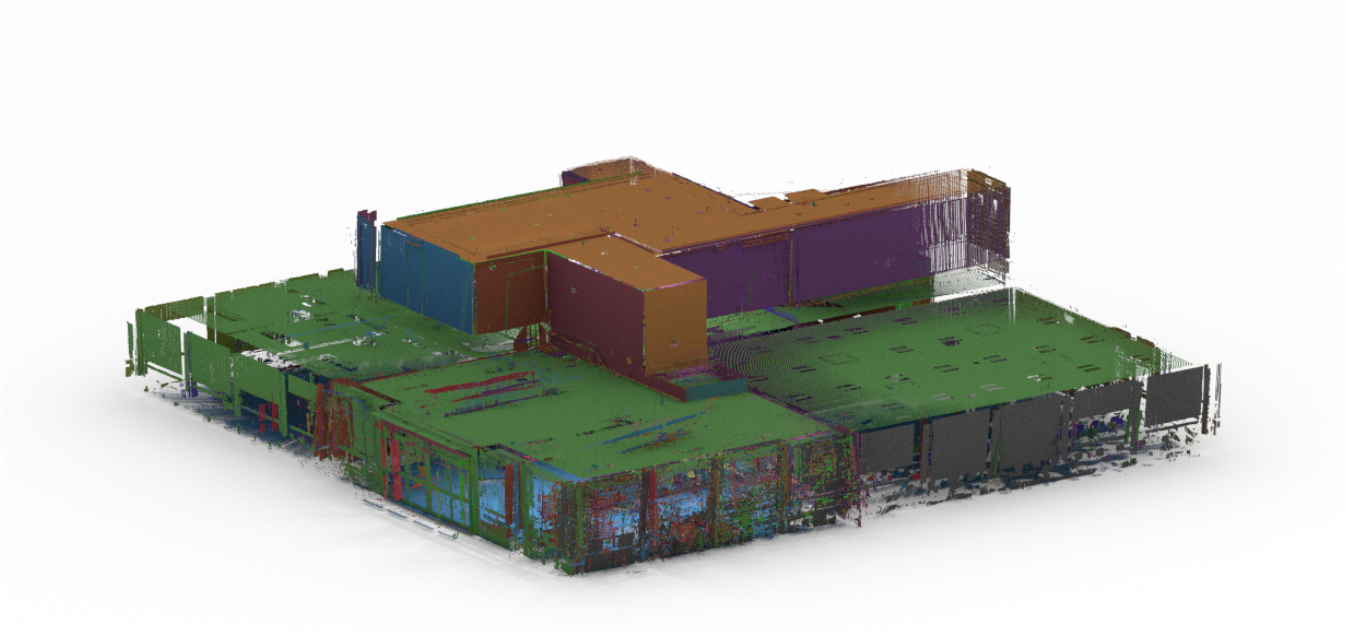

Figure 6: *Euler (Figure 1), RANSAC: Reprojected cloud.*

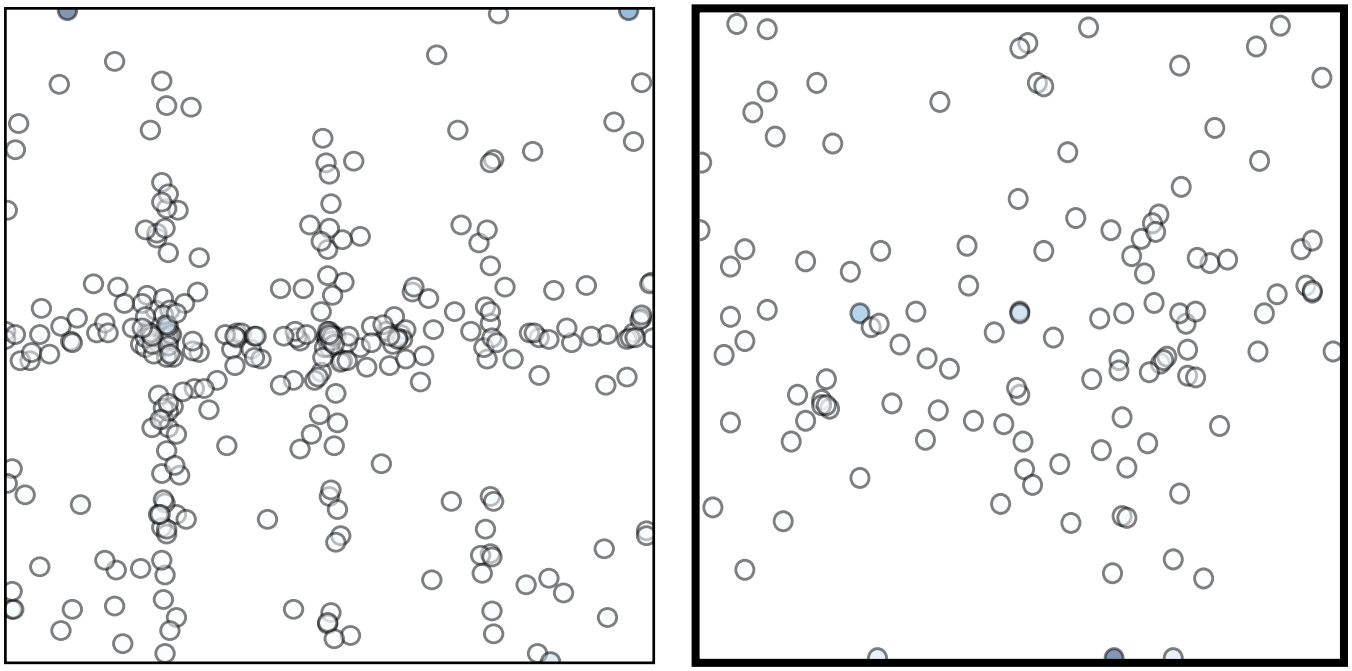

Figure 7: *Euler: RANSAC (left) and our (right) distributions.*

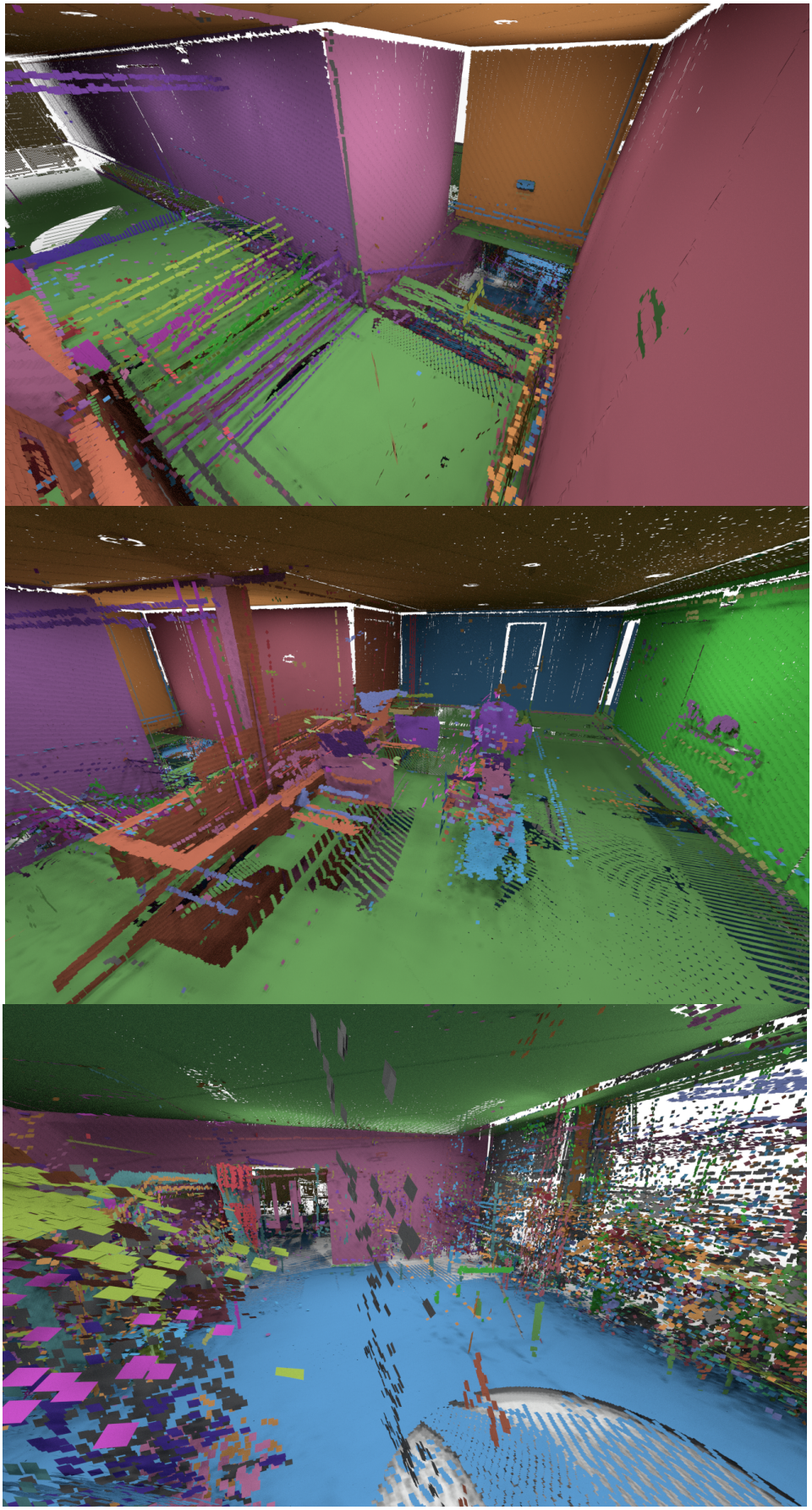

Figure 8: *Euler (Figure 1), RANSAC: Close views of the reprojected cloud.*

Euler-Cut

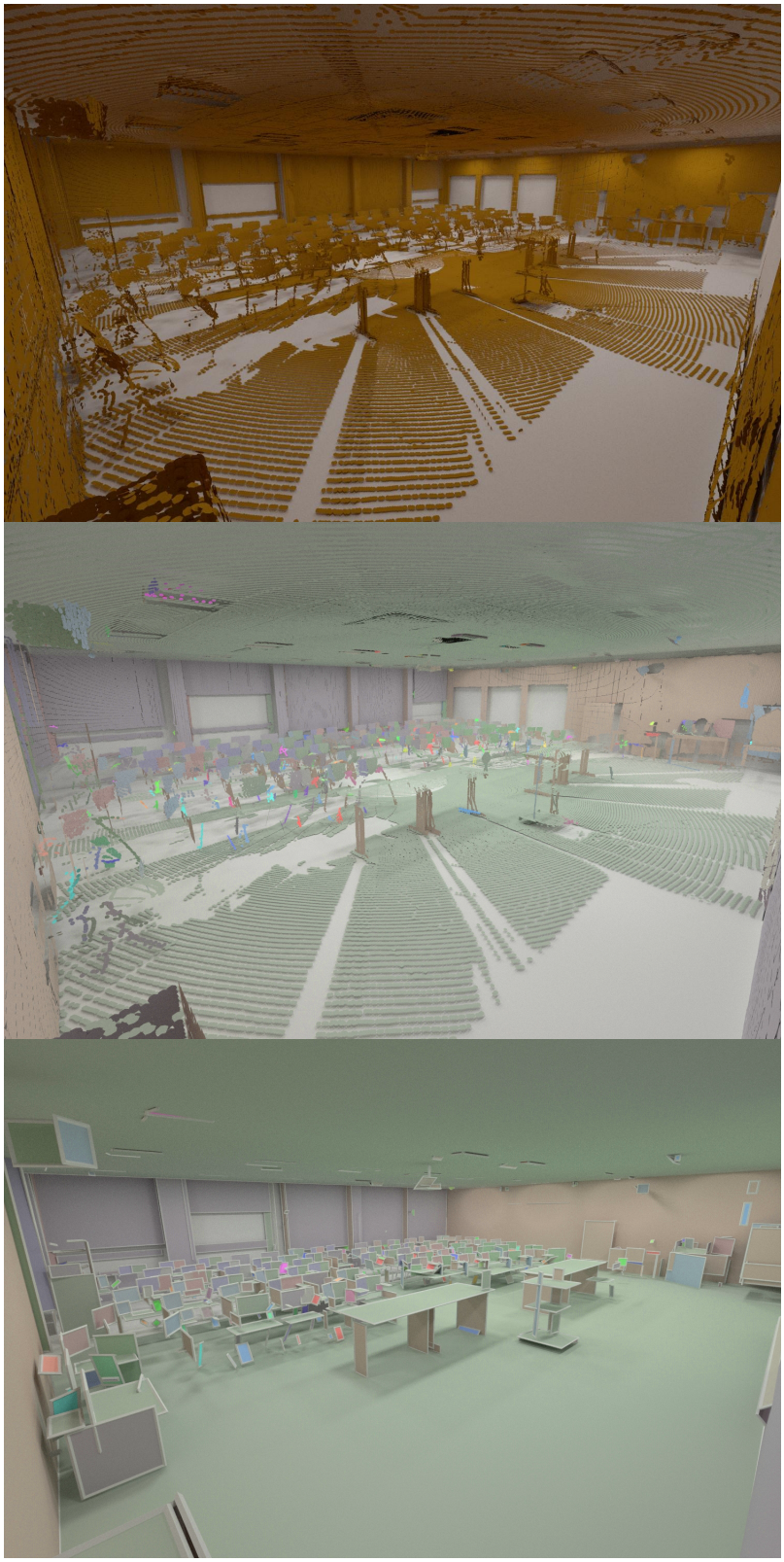

Figure 9: *Euler-Cut (Figure 6),* RAPTER*: From top to bottom: input cloud, reprojected cloud, planar polygons.*

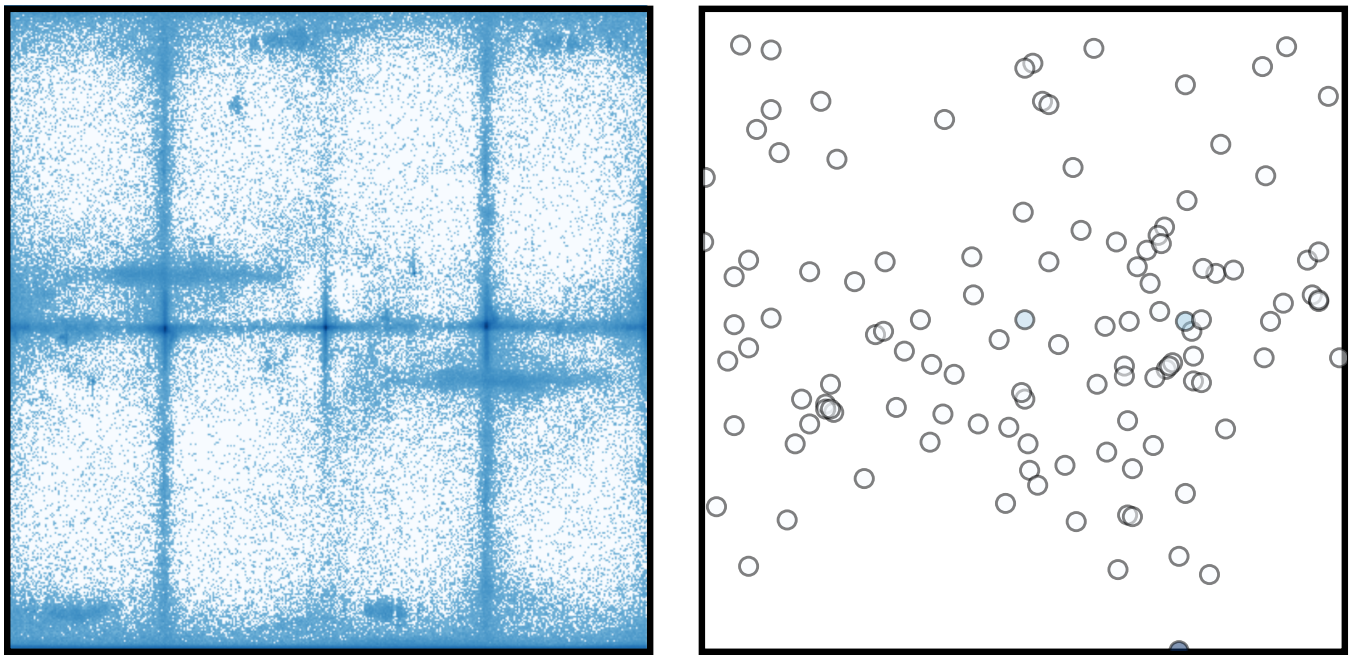

Figure 10: *Euler-Cut (Figure 6),* RAPTER*: Input and output distributions.*

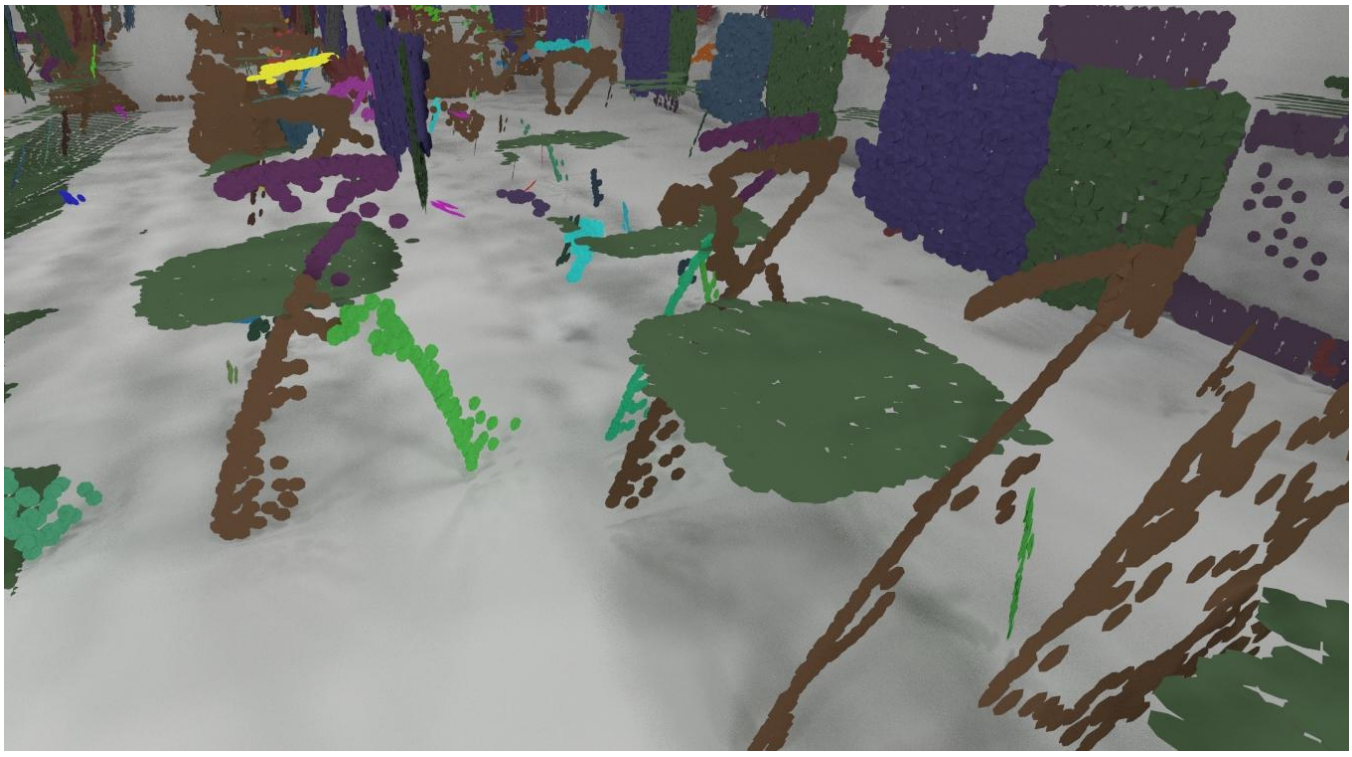

Figure 11: *Euler-Cut (Figure 6),*RAPTER*: Close views of the reprojected cloud.*

Empire

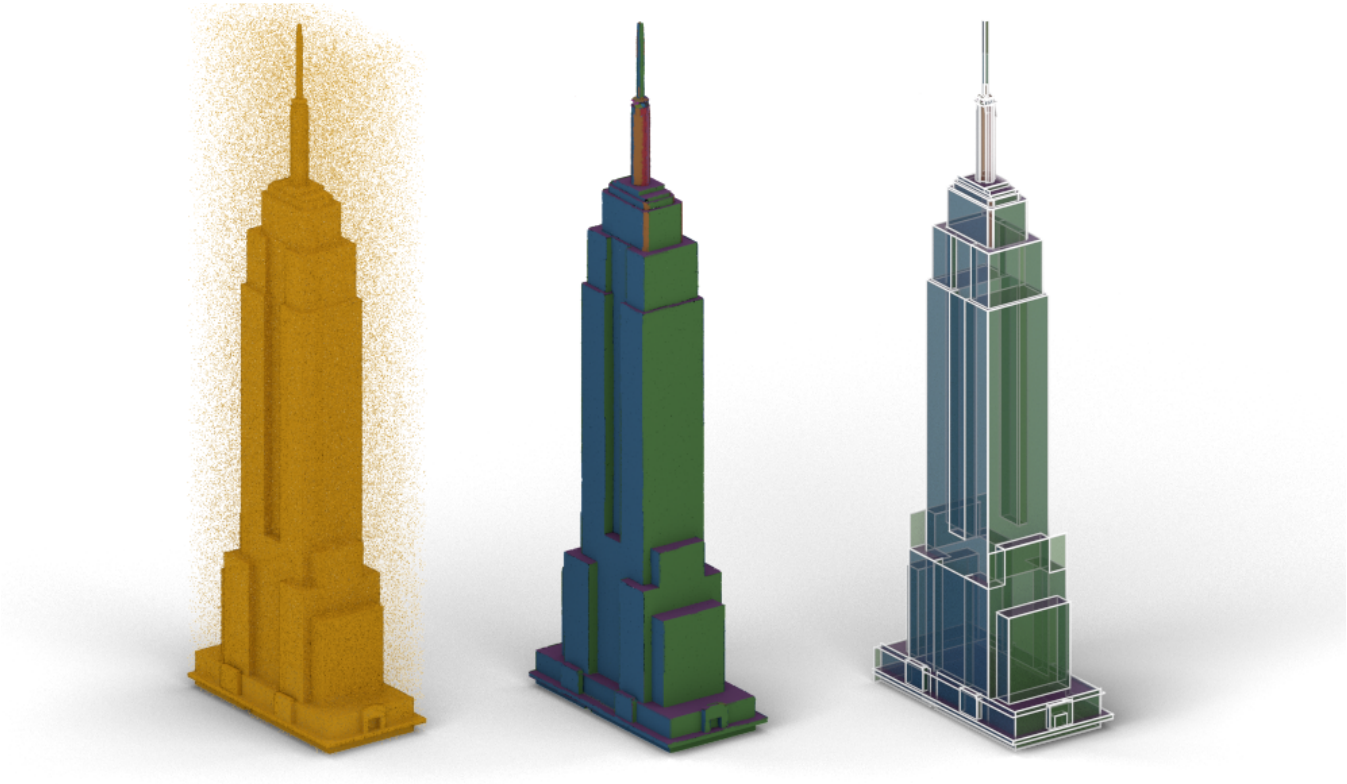

Figure 12: *Empire (Figure 10),* RAPTER*: From left to right: input cloud, reprojected cloud, planar polygons.*

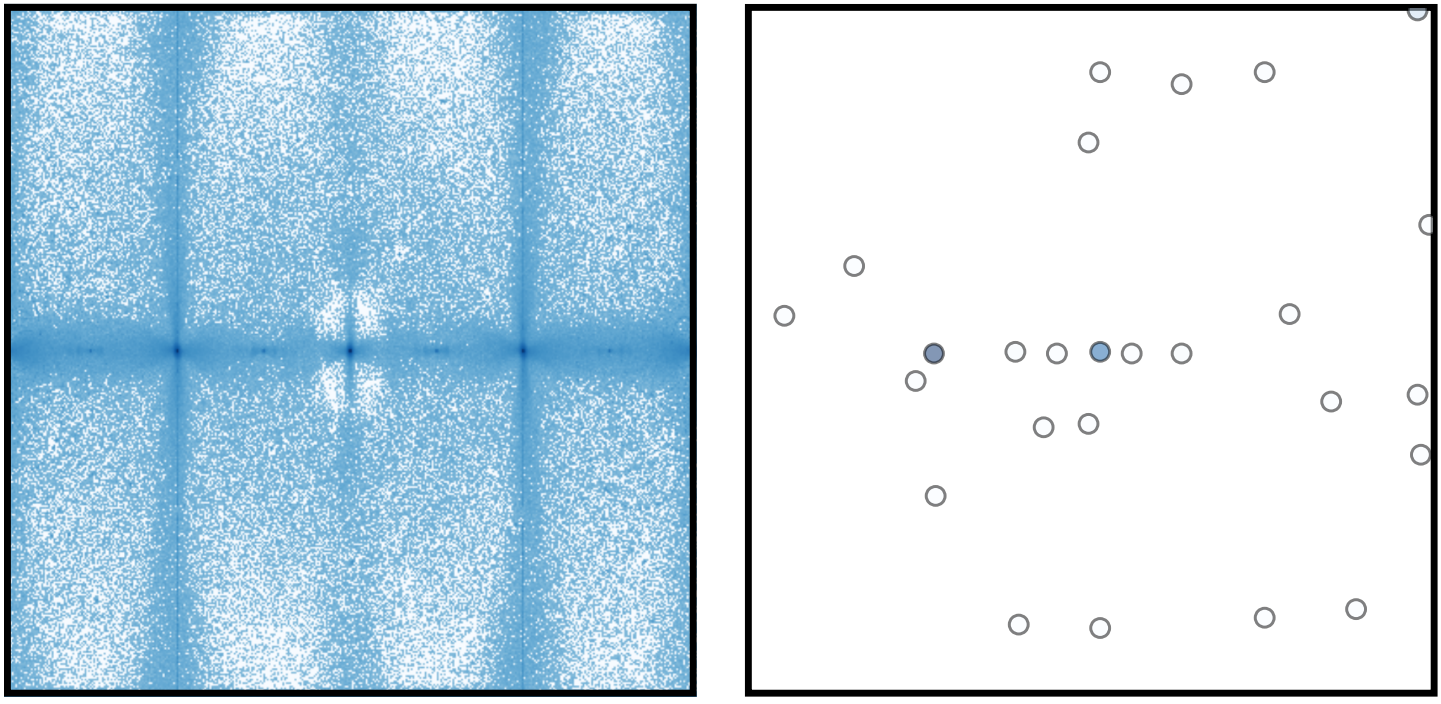

Figure 13: *Empire (Figure 10),* RAPTER*: Input and output distributions.*

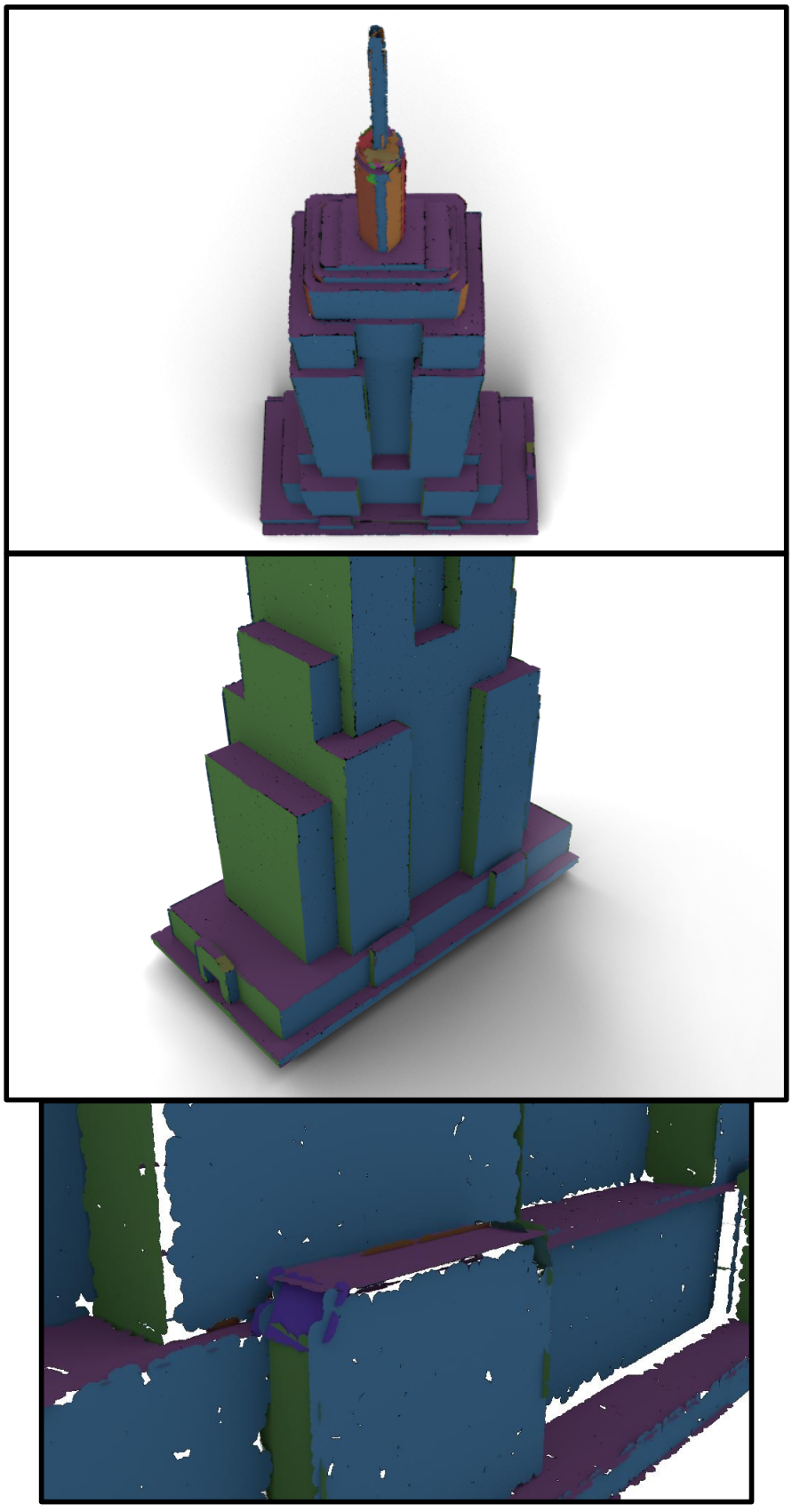

Figure 14: *Empire (Figure 10),* RAPTER*: Close views of the reprojected cloud.*

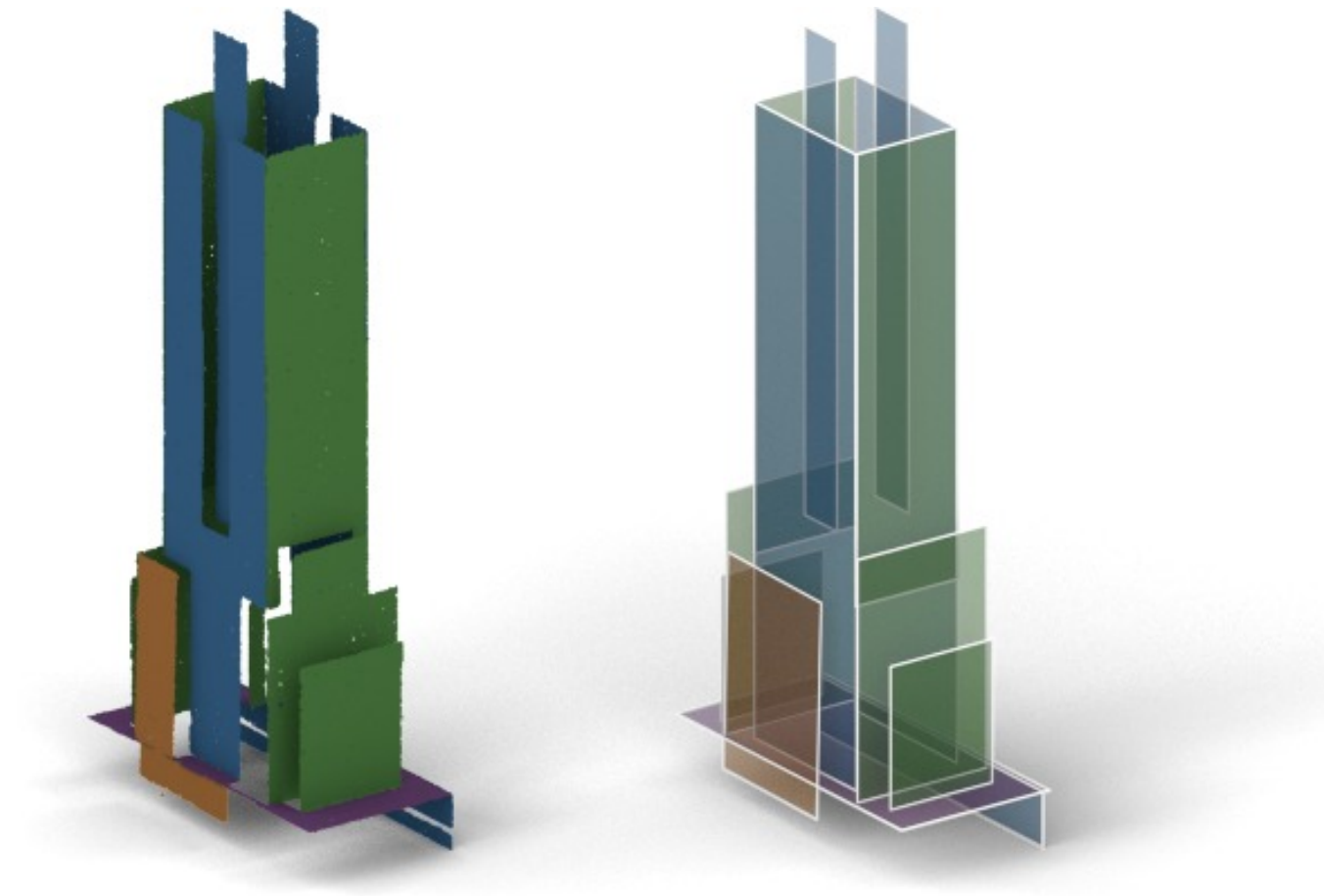

Figure 15: *Empire (Figure 10), GlobFit: Reprojected cloud (left), planar polygons (right). GlobFit only had the largest (most supported) 13 out of 4693 input planes as input.*

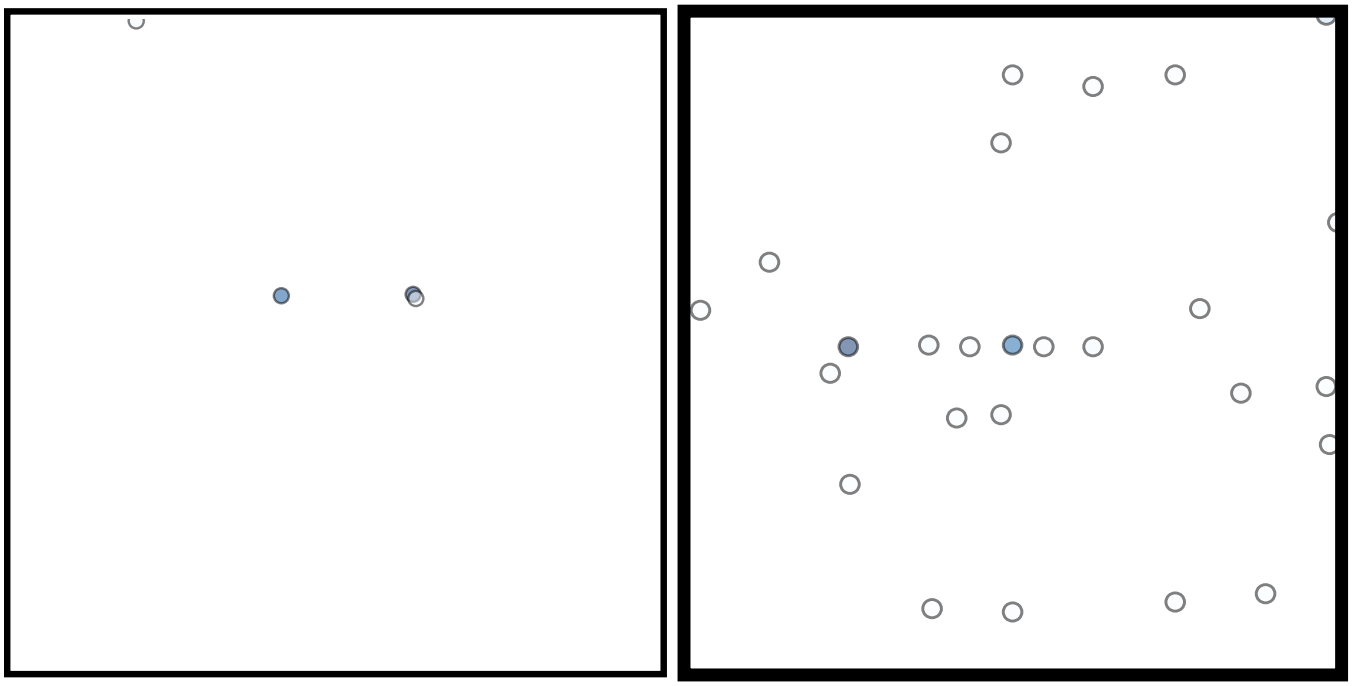

Figure 16: *Empire (Figure 10): Normal distributions of GlobFit (left) and* RAPTER *(right).*

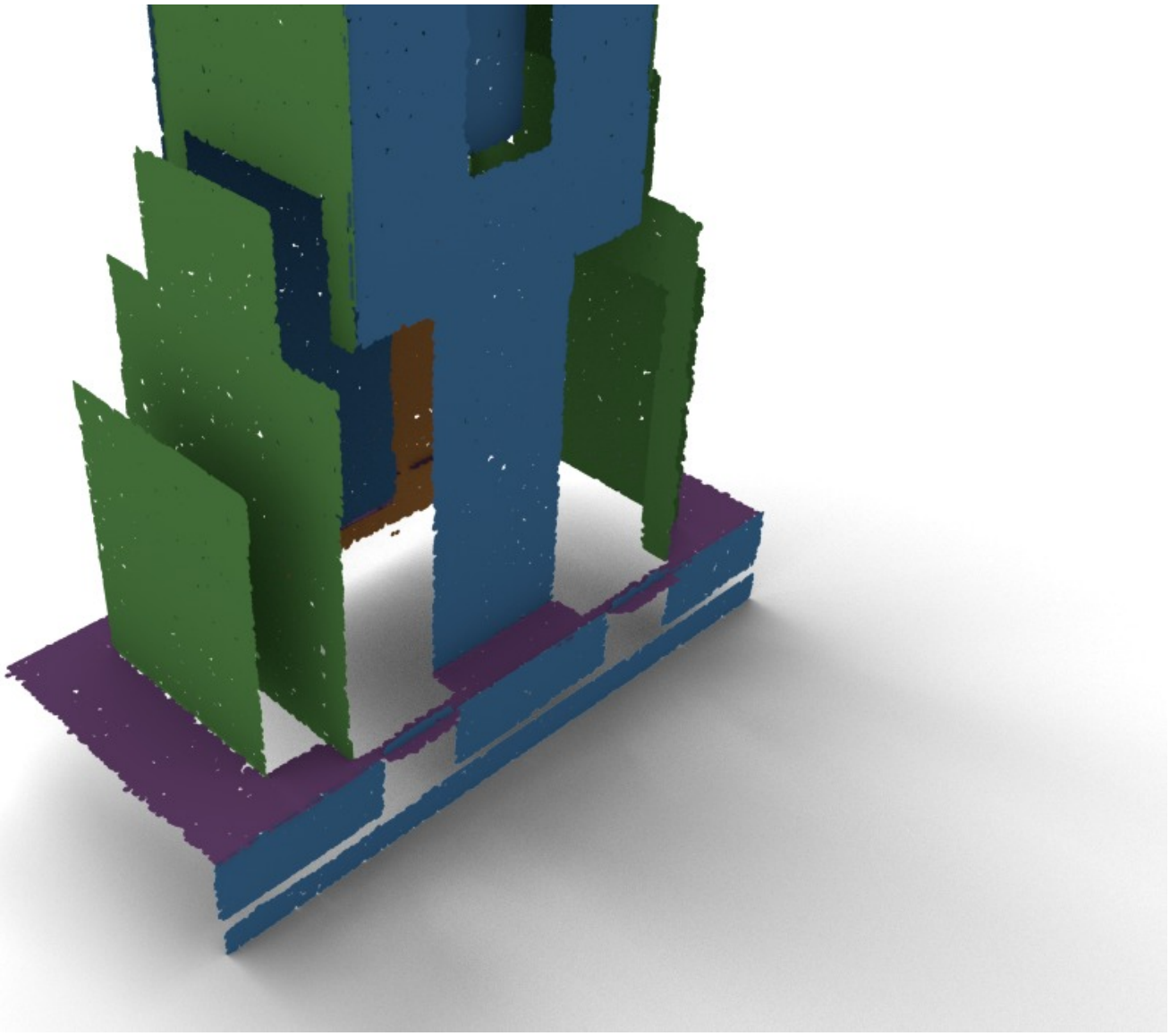

Figure 17: *Empire (Figure 10), GlobFit: Close view of the reprojected cloud*

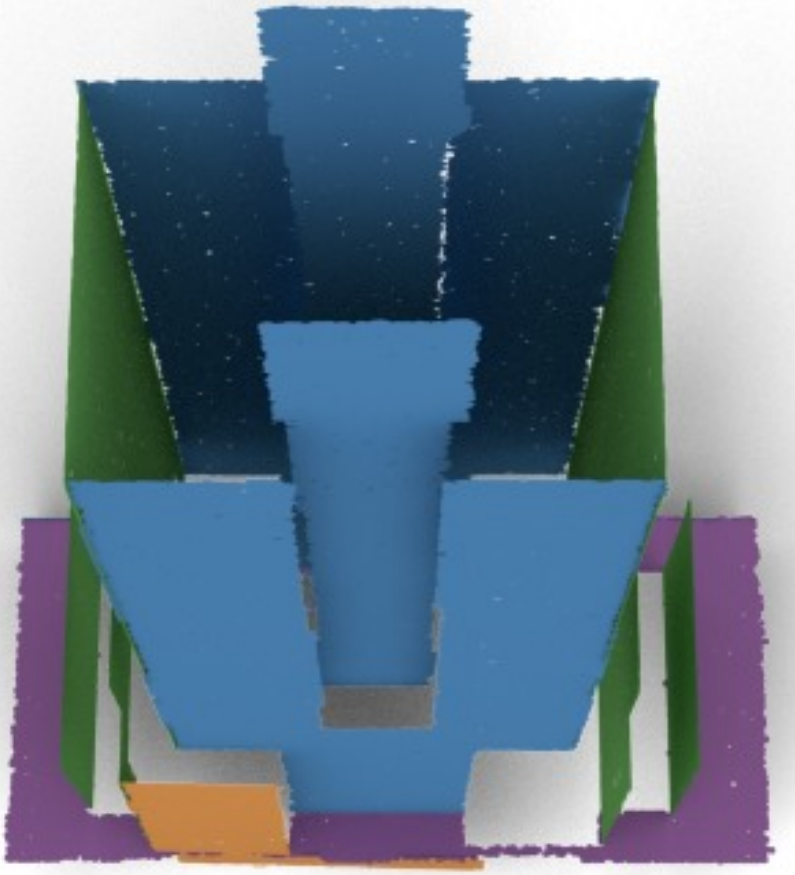

Figure 18: *Empire (Figure 10), GlobFit: Close view of the reprojected cloud*

Figure 19: *Empire (Figure 10), [Lafarge and Alliez 2013]: Reprojected cloud (left), planar polygons (right)*

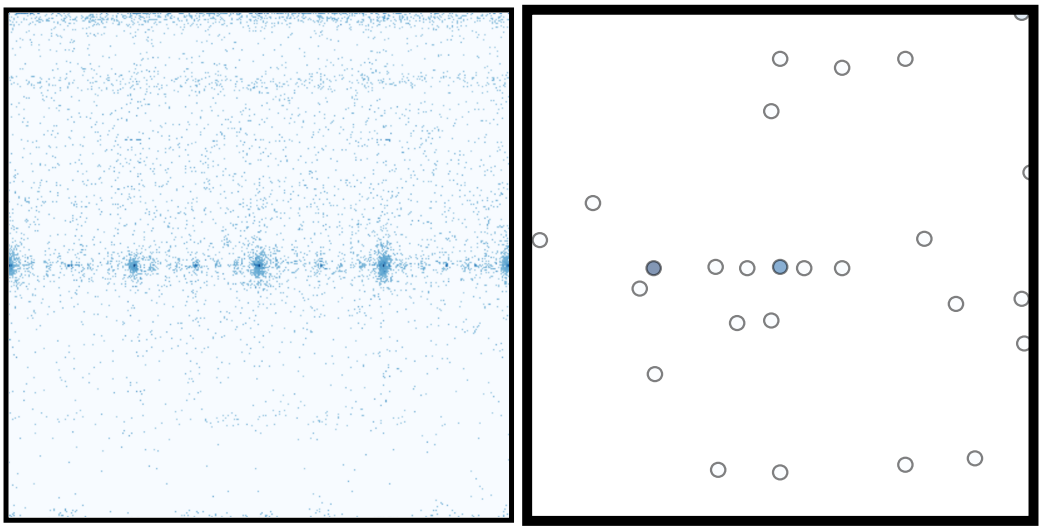

Figure 20: *Empire (Figure 10): Normal distributions of [Lafarge and Alliez 2013] (left) and* RAPTER *(right).*

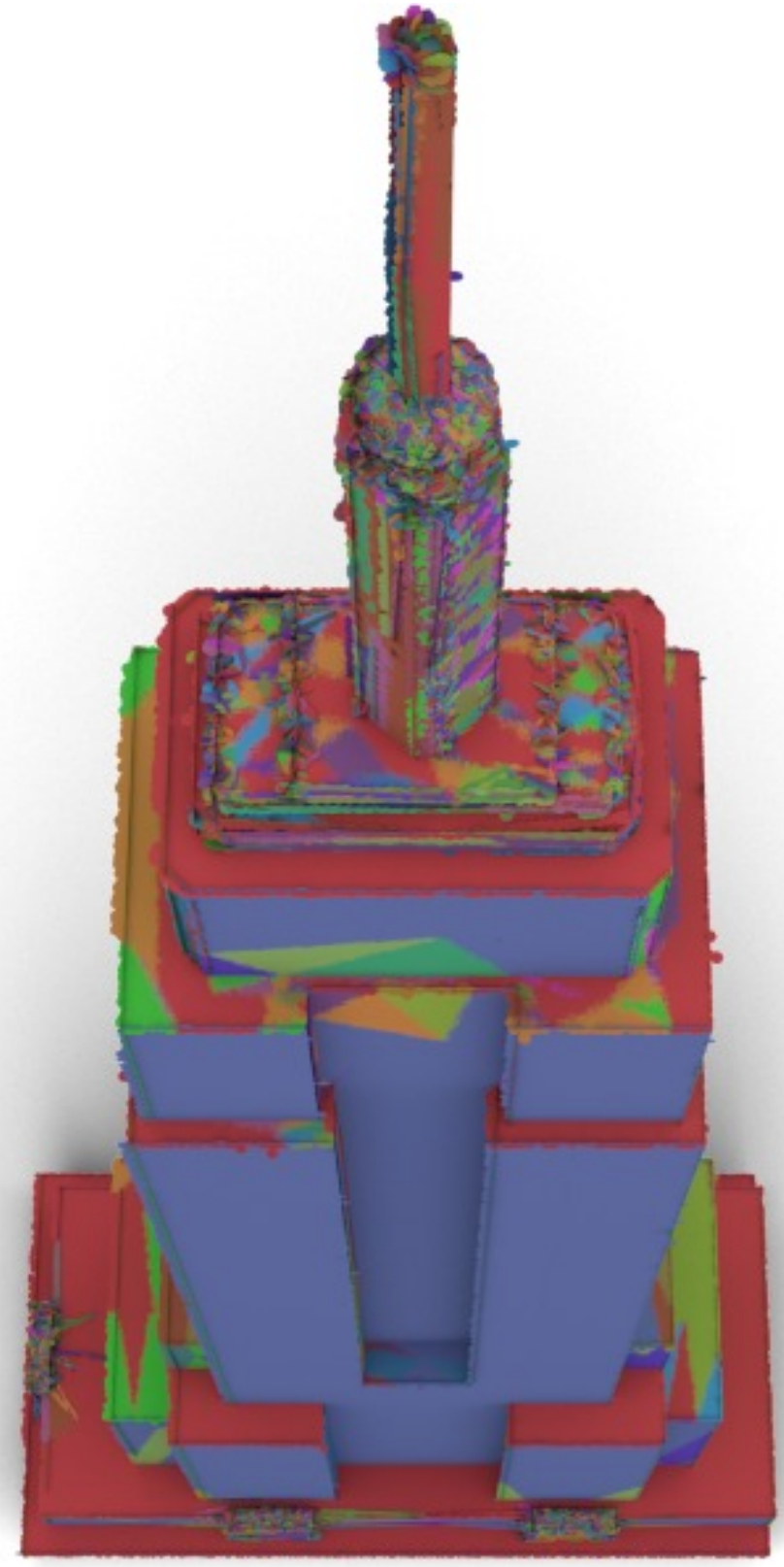

Figure 21: *Empire (Figure 10), [Lafarge and Alliez 2013]: Close view of the reprojected cloud*

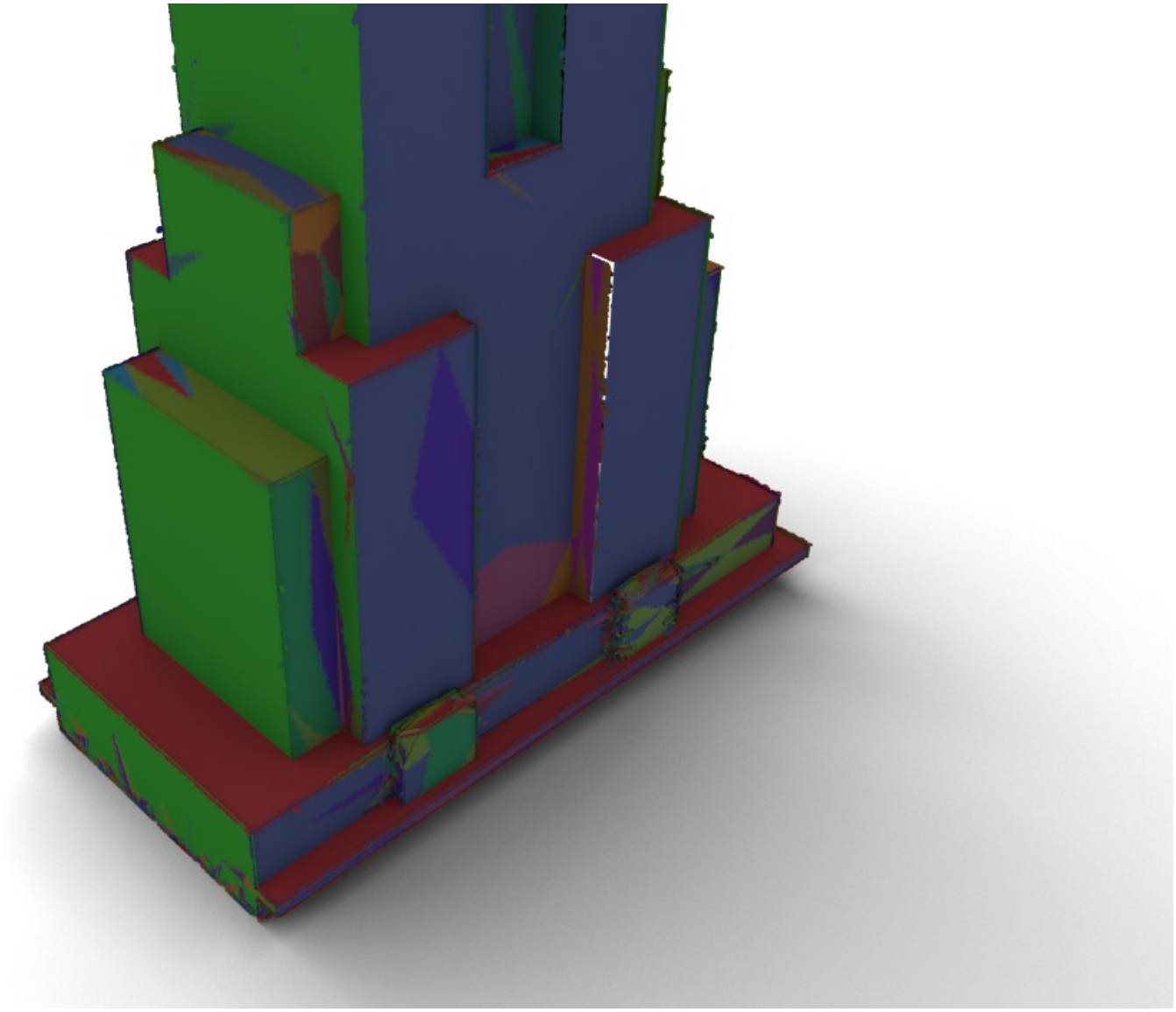

Figure 22: *Empire (Figure 10), [Lafarge and Alliez 2013]: Close view of the reprojected cloud*

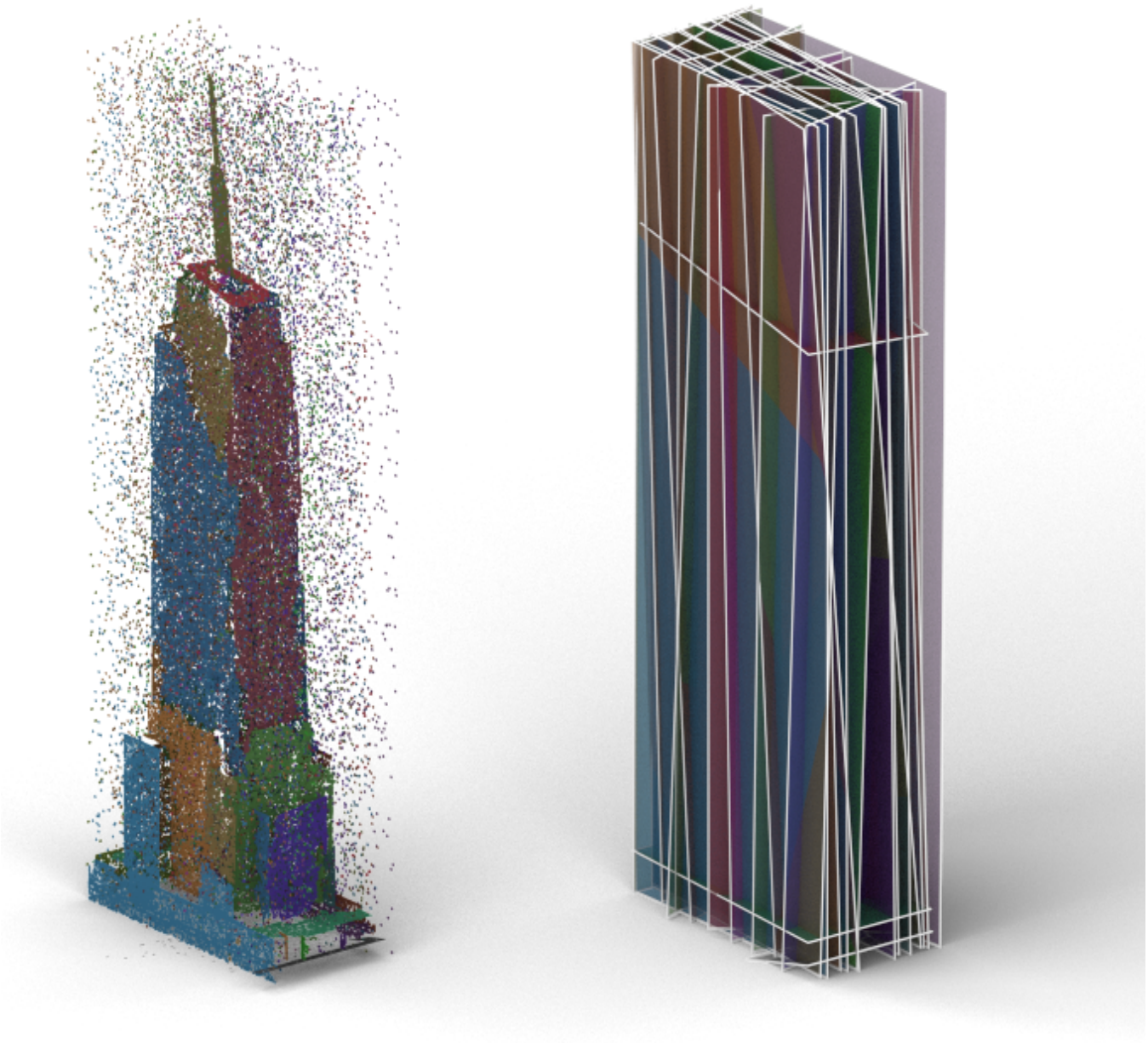

Figure 23: *Empire (Figure 10),* PEARL*: Reprojected cloud and planar polygons.*

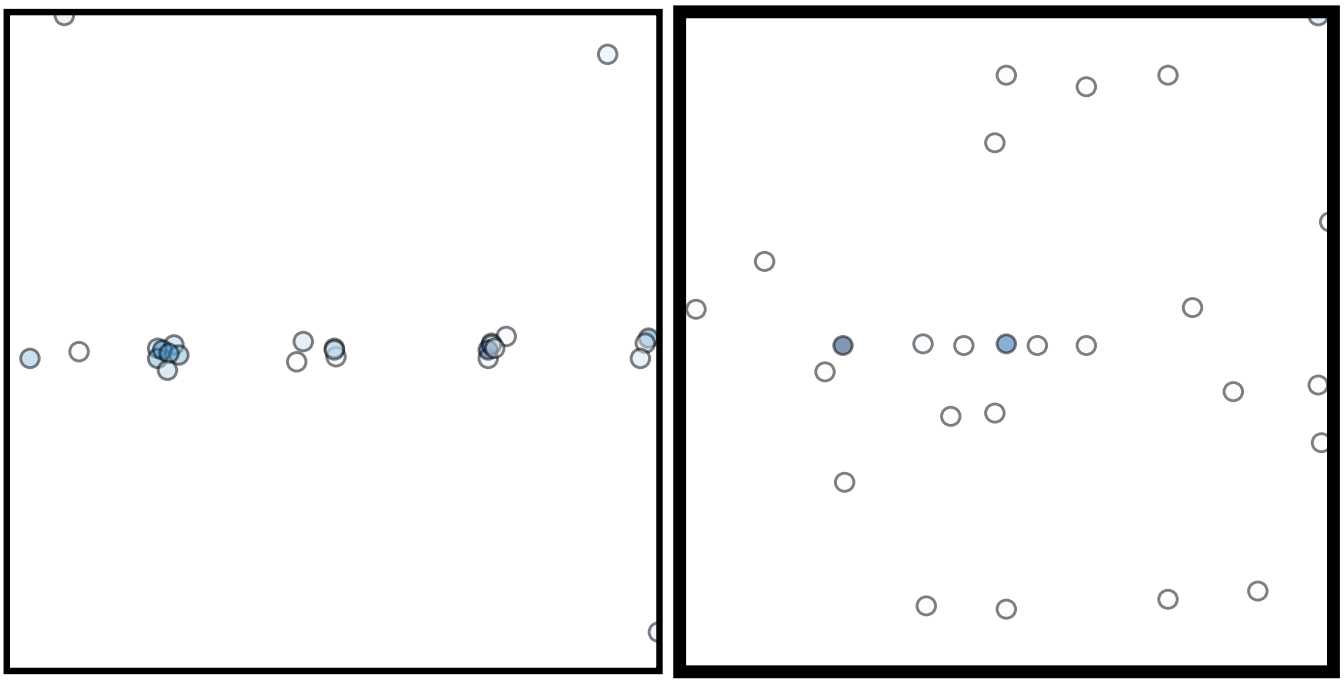

Figure 24: *Empire:*PEARL *(left) and our (right) distributions.*

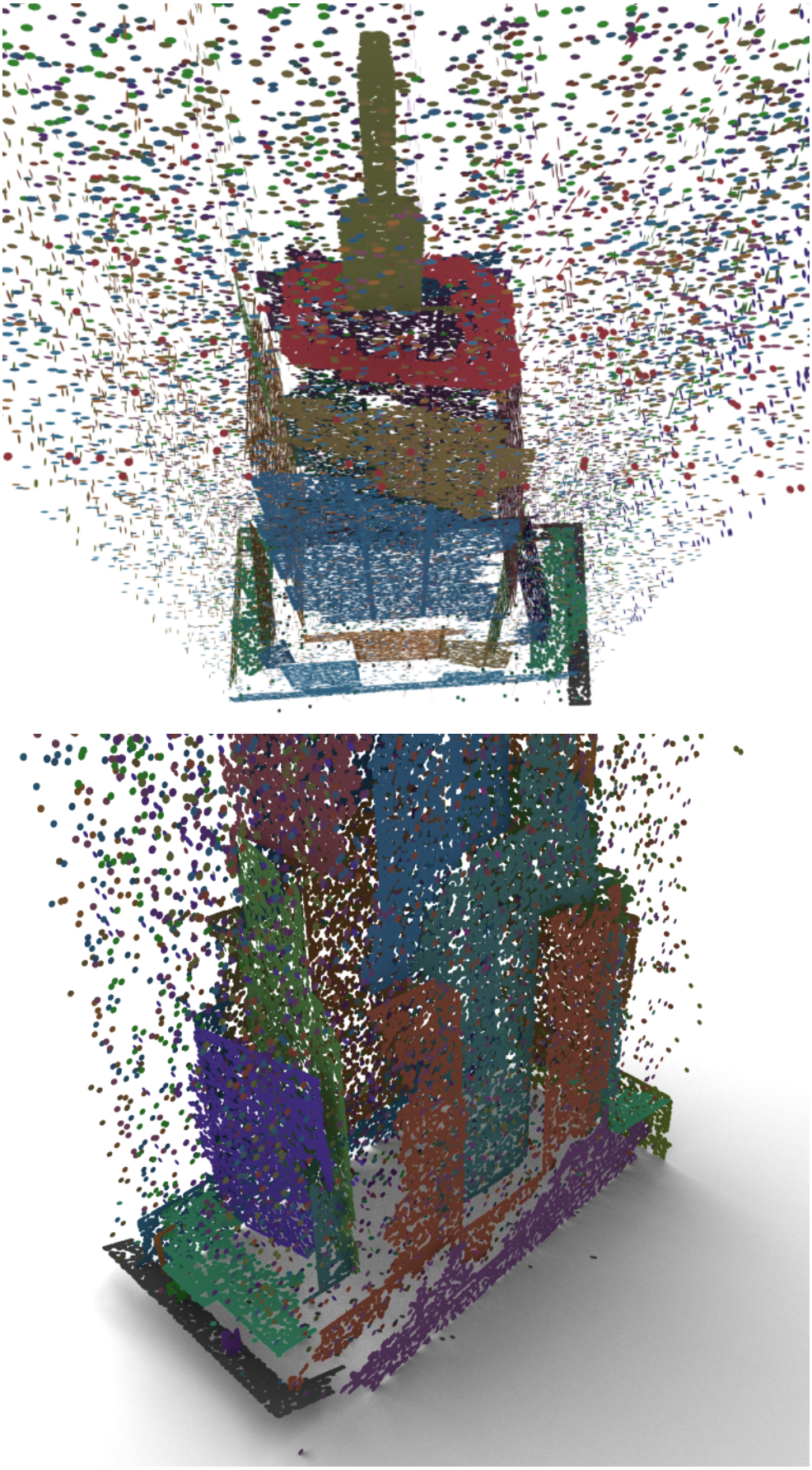

Figure 25: *Empire (Figure 10),* PEARL*: Close views of the reprojected cloud.*

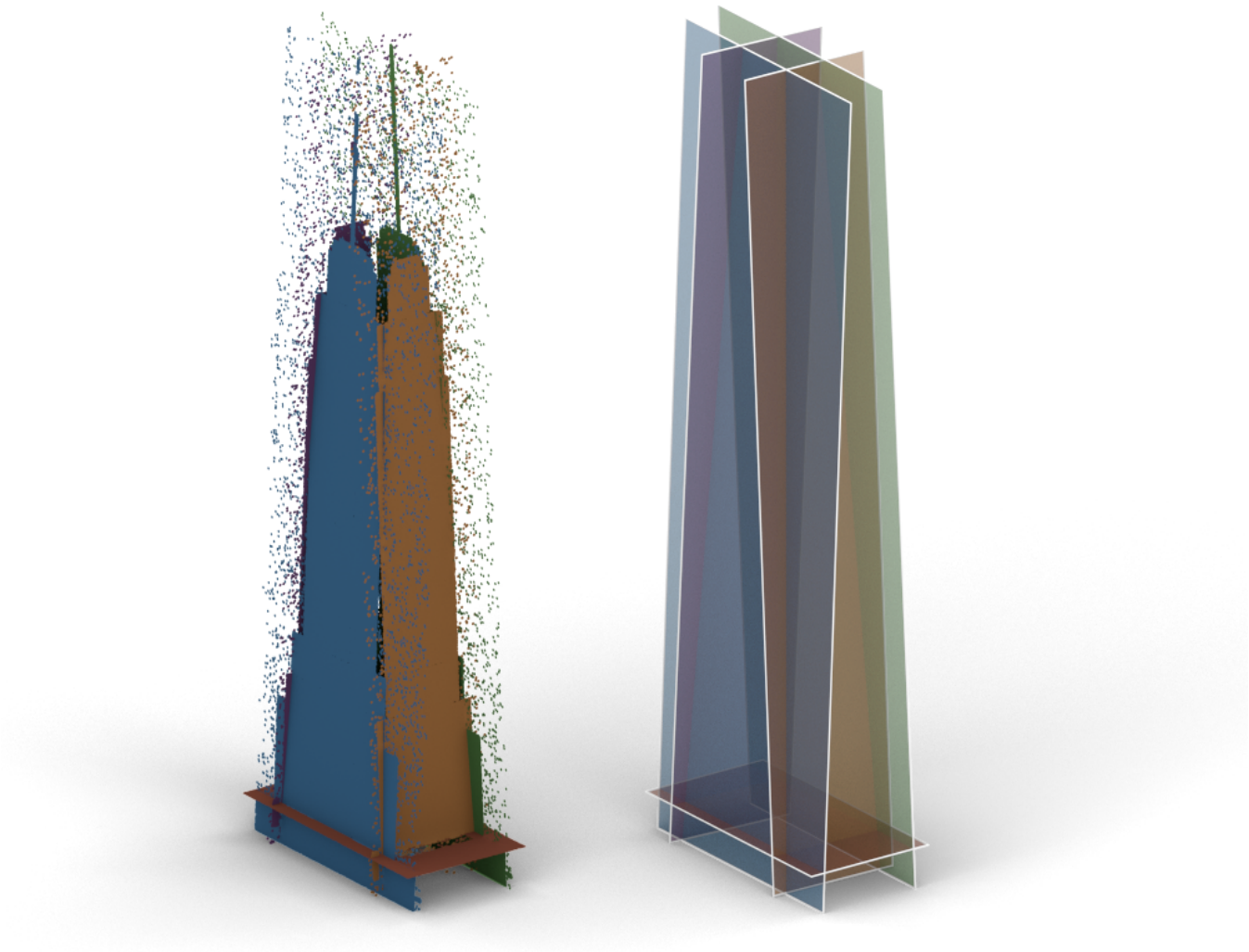

Figure 26: *Empire (Figure 10), RANSAC: Reprojected cloud and planar polygons.*

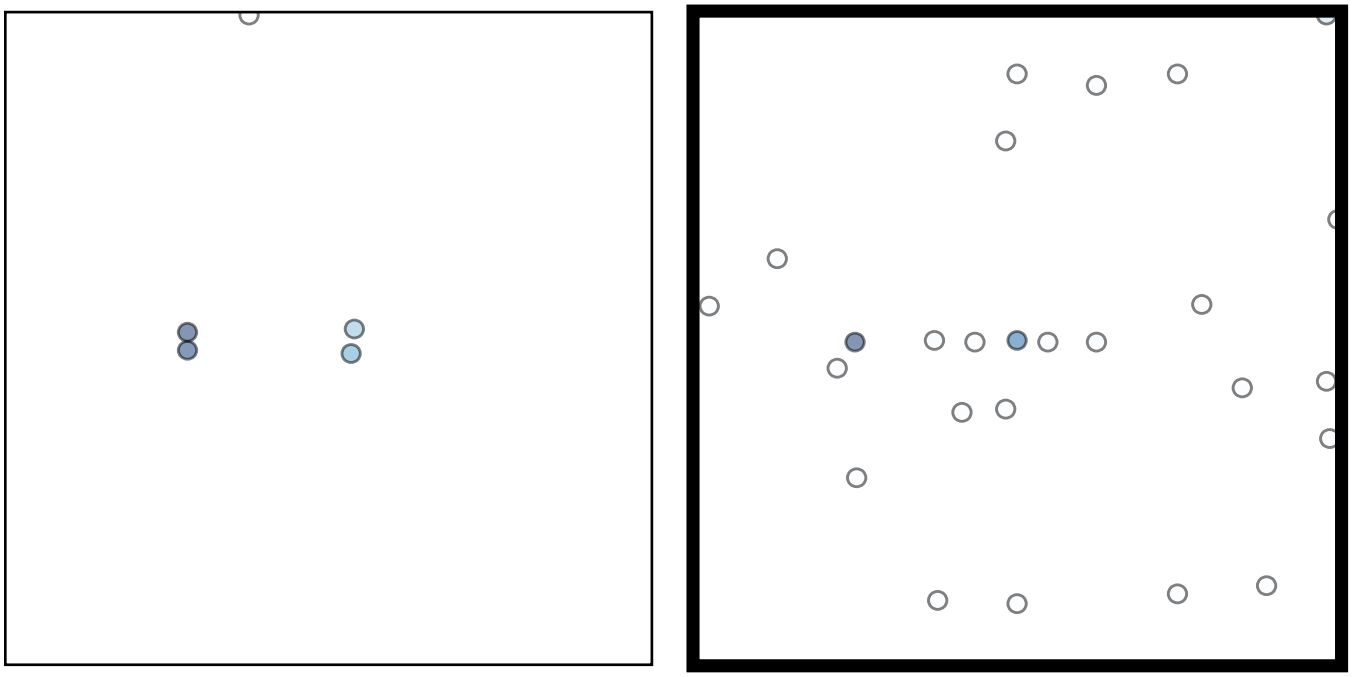

Figure 27: *Empire: RANSAC (left) and our (right) distributions.*

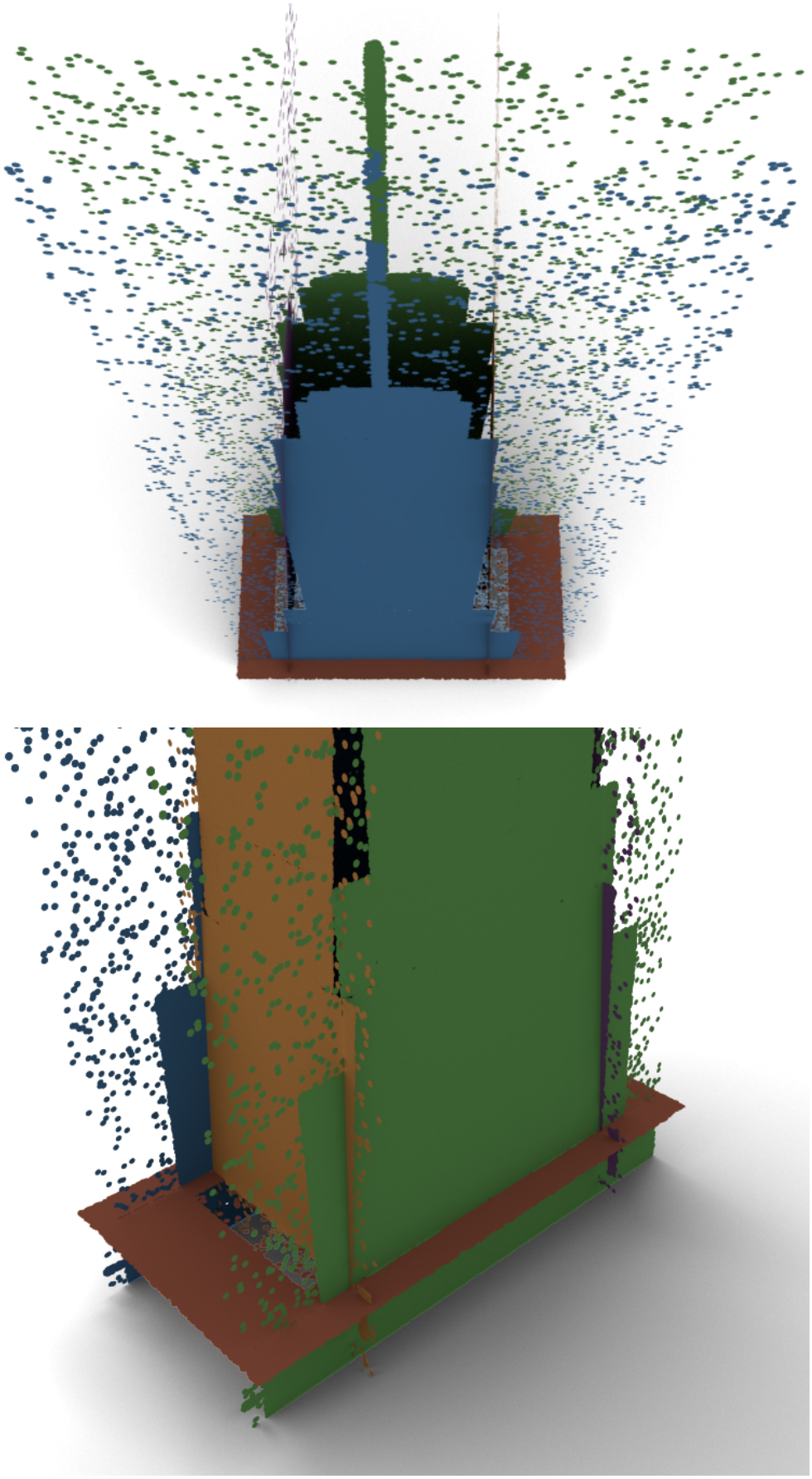

Figure 28: *Empire (Figure 10), RANSAC: Close views of the reprojected cloud.*

Nola

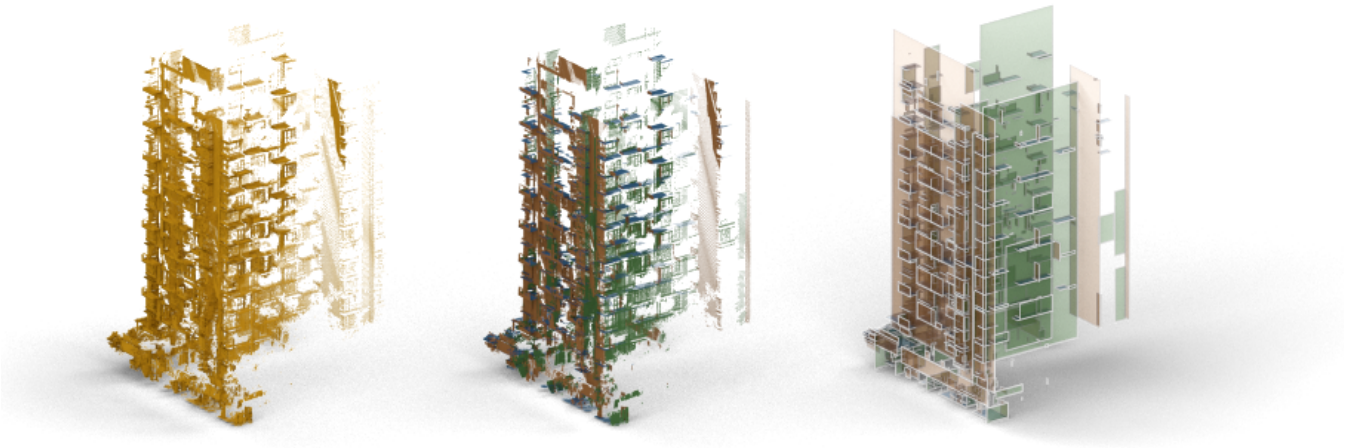

Figure 29: *Nola (Figure 11),* RAPTER*: From left to right: input cloud, reprojected cloud, planar polygons.*

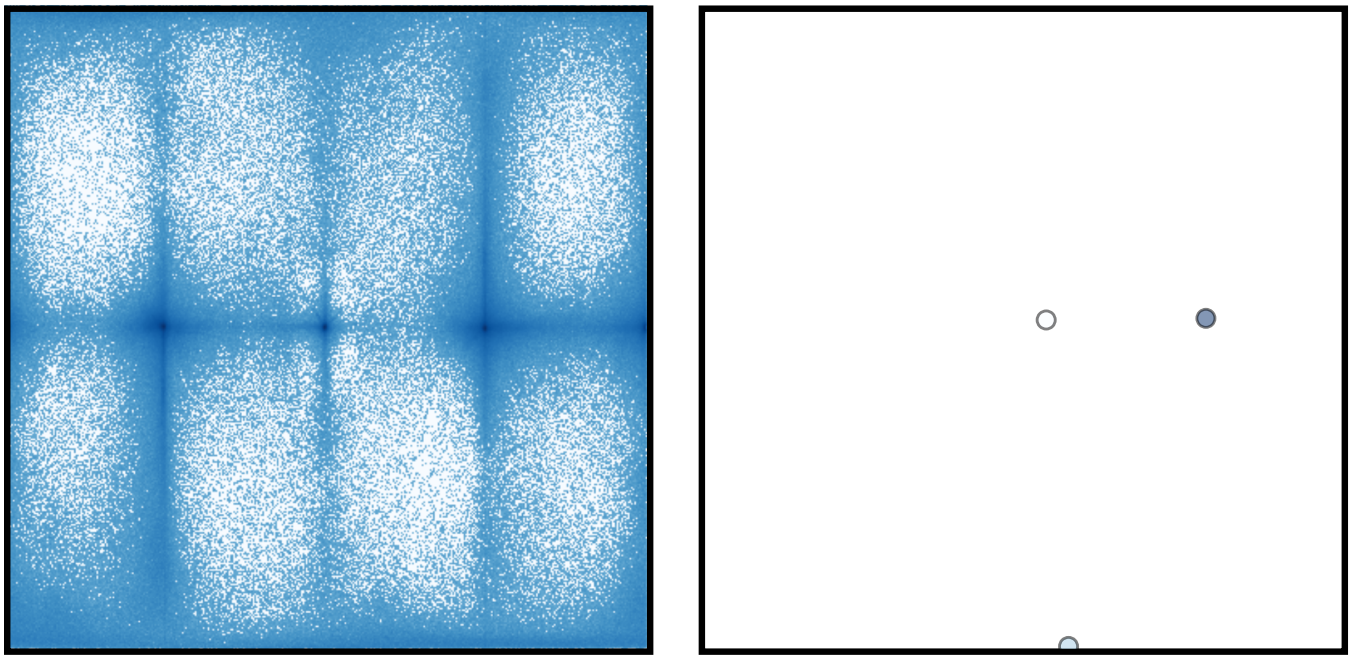

Figure 30: *Nola (Figure 11),* RAPTER*: Input and output distributions.*

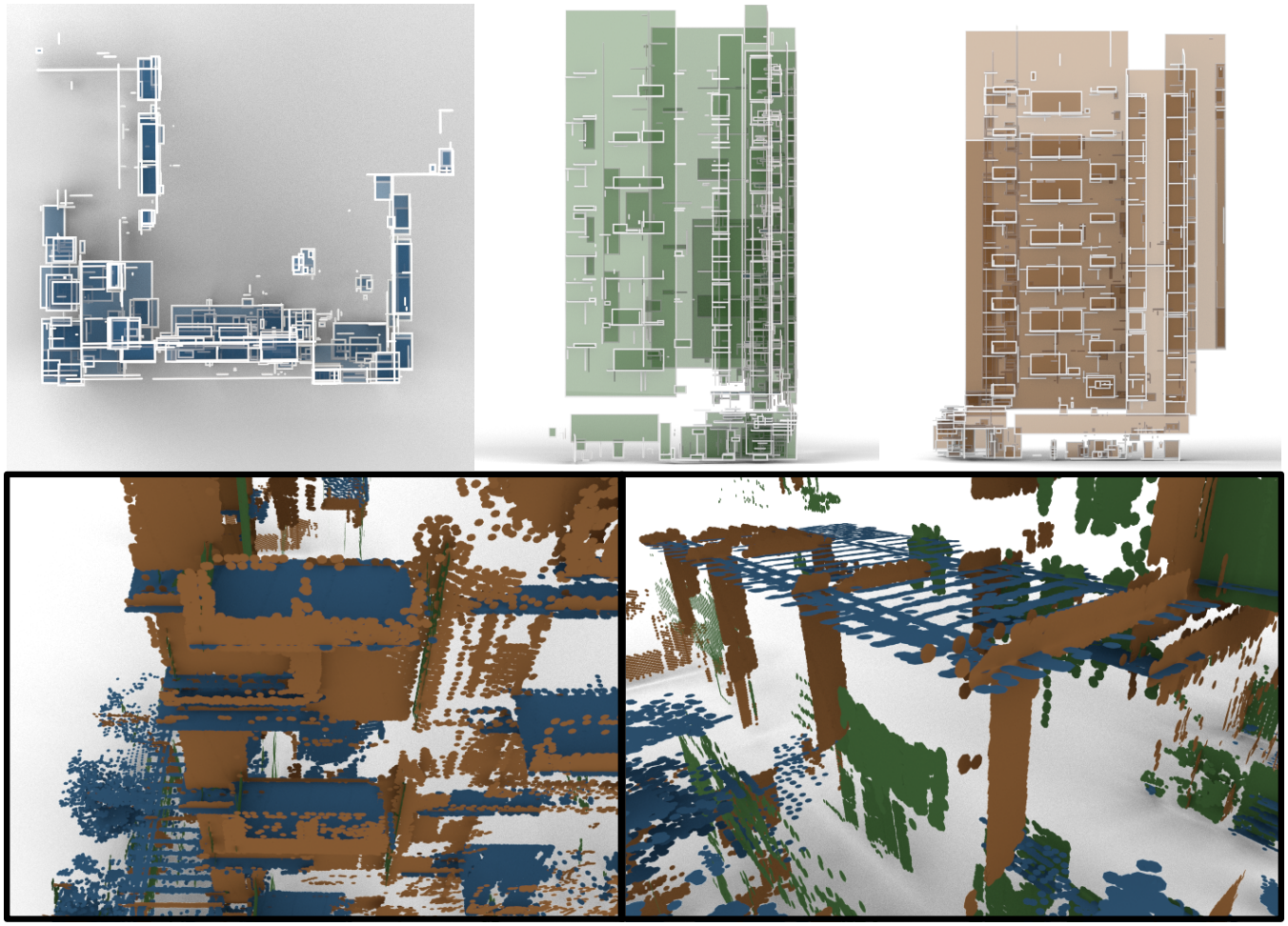

Figure 31: *Nola (Figure 11),* RAPTER*: Top orthographic views (top, side, front) of the planar polygons. Bottom: Close views of the reprojected cloud.*

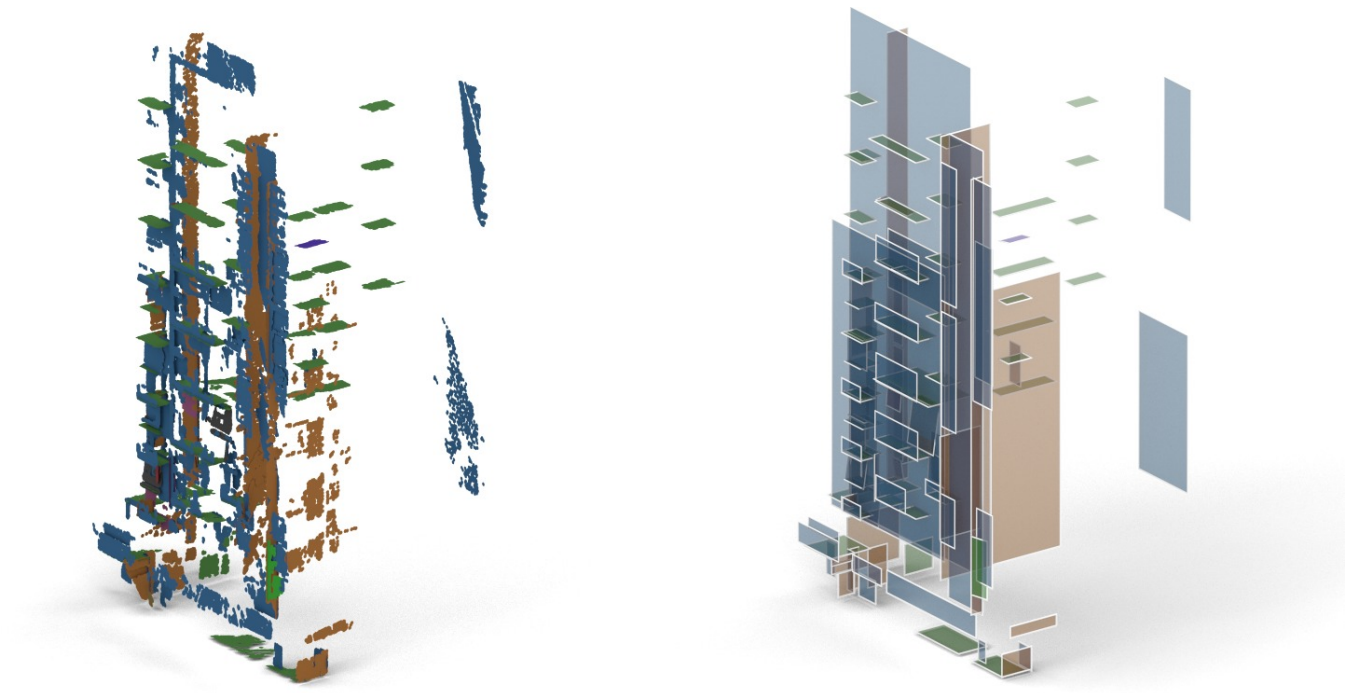

Figure 32: *Nola (Figure 11), GlobFit: Reprojected pointcloud and planar polygons. GlobFit only had the largest (most supported) 120 out of 15685 input planes as input.*

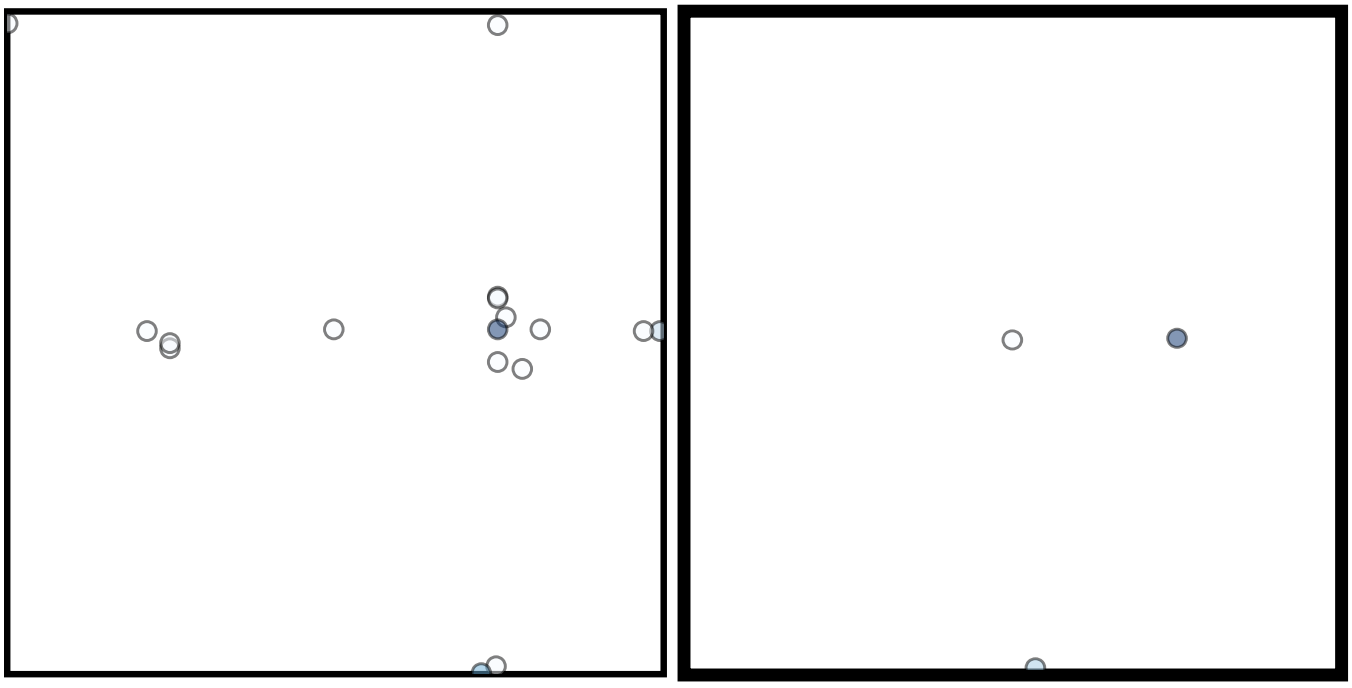

Figure 33: *Nola (Figure 11): Normal distributions of GlobFit (left) and* RAPTER *(right).*

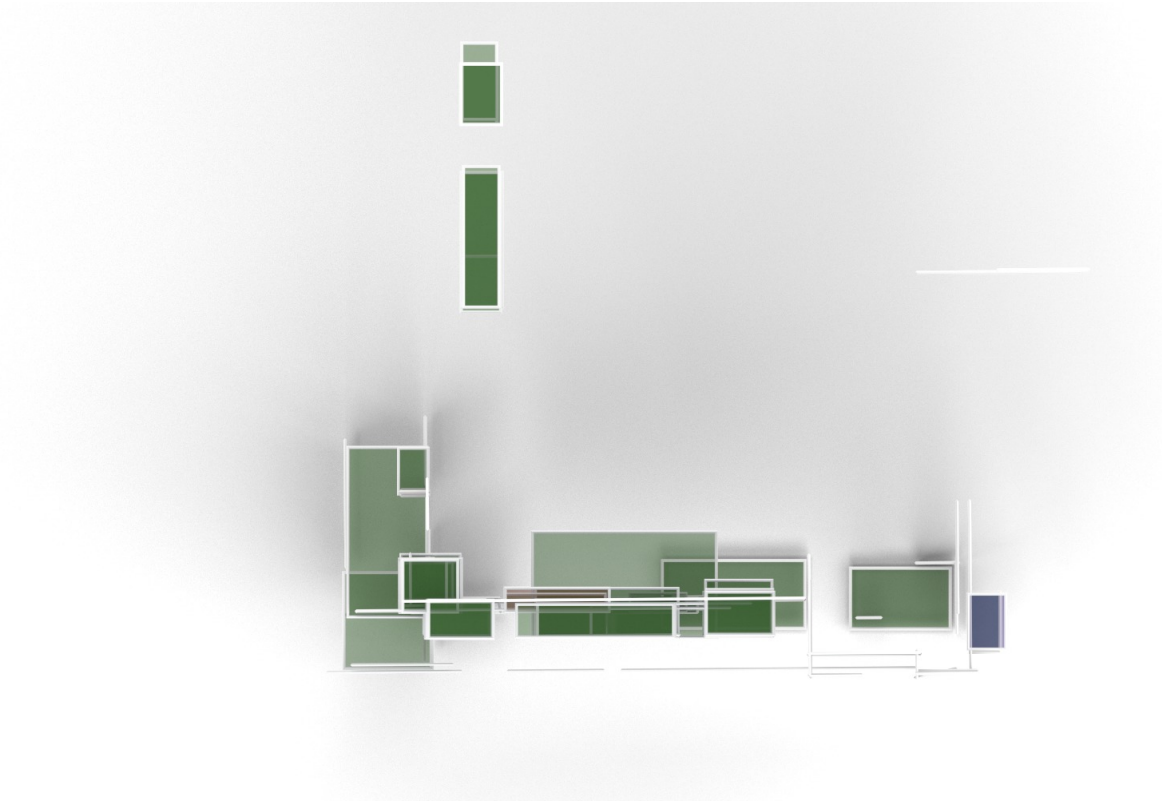

Figure 34: *Nola (Figure 11), GlobFit: Planar polygons top view.*

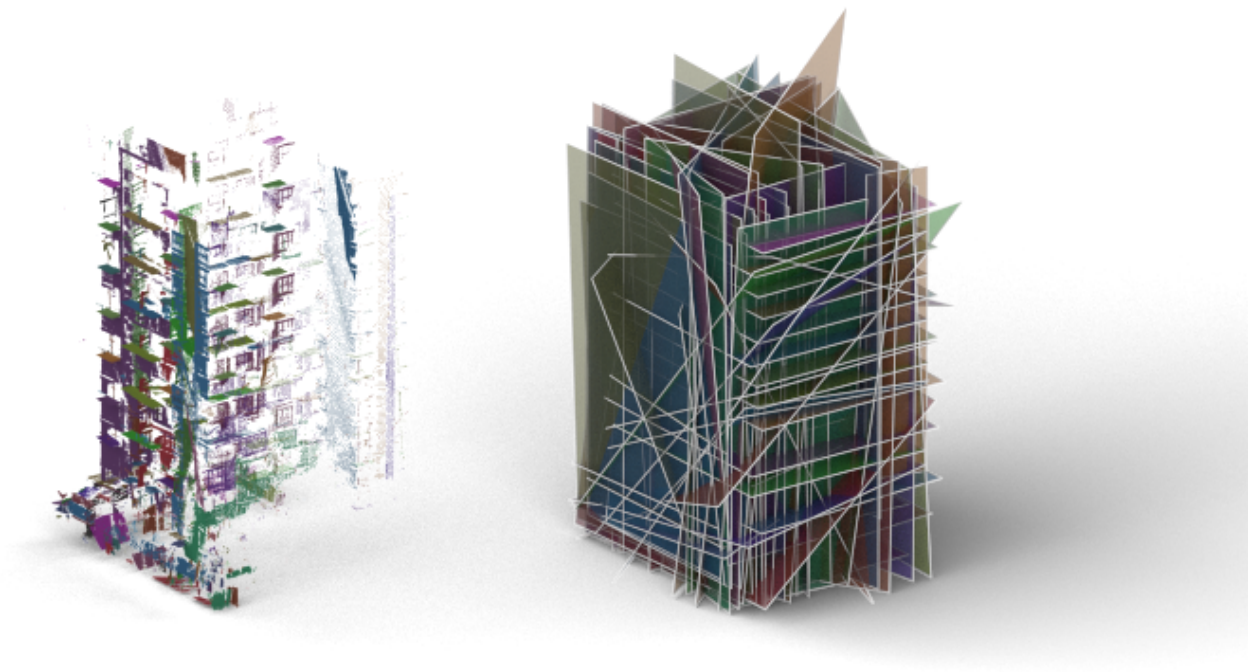

Figure 35: *Nola (Figure 11),* PEARL*: Reprojected cloud and planar polygons.*

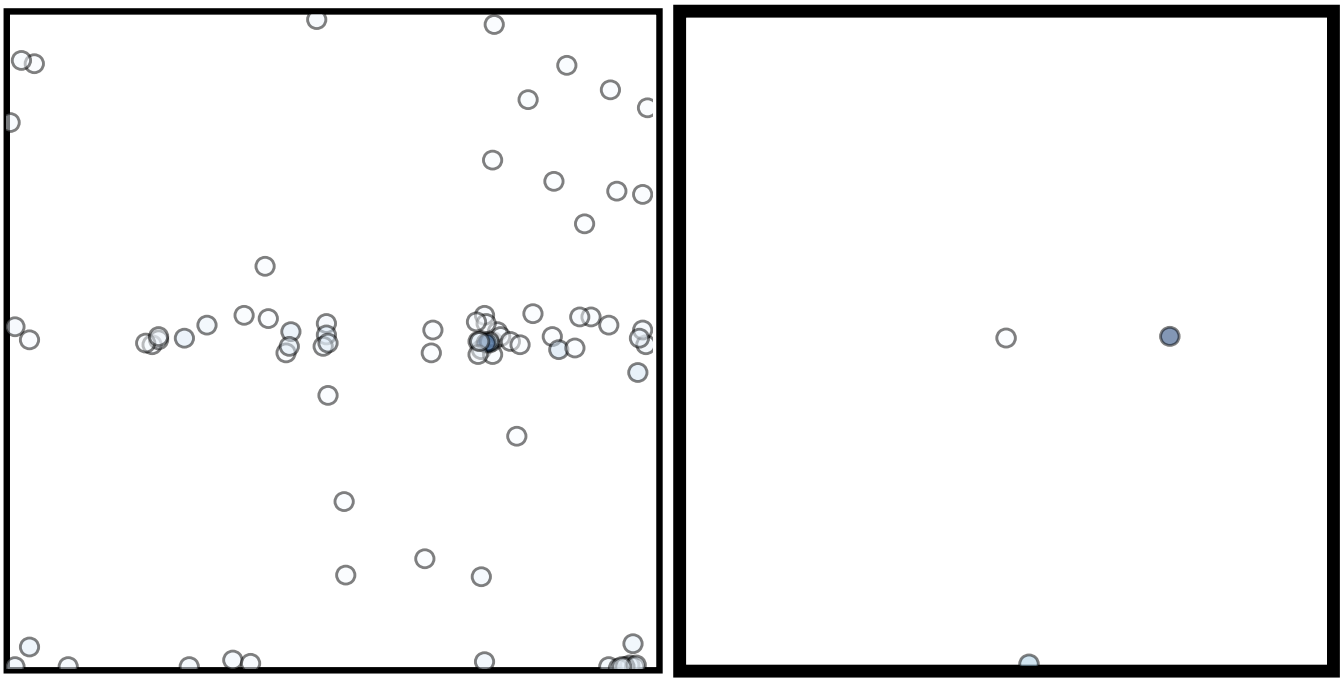

Figure 36: *Nola:*PEARL *(left) and our (right) distributions.*

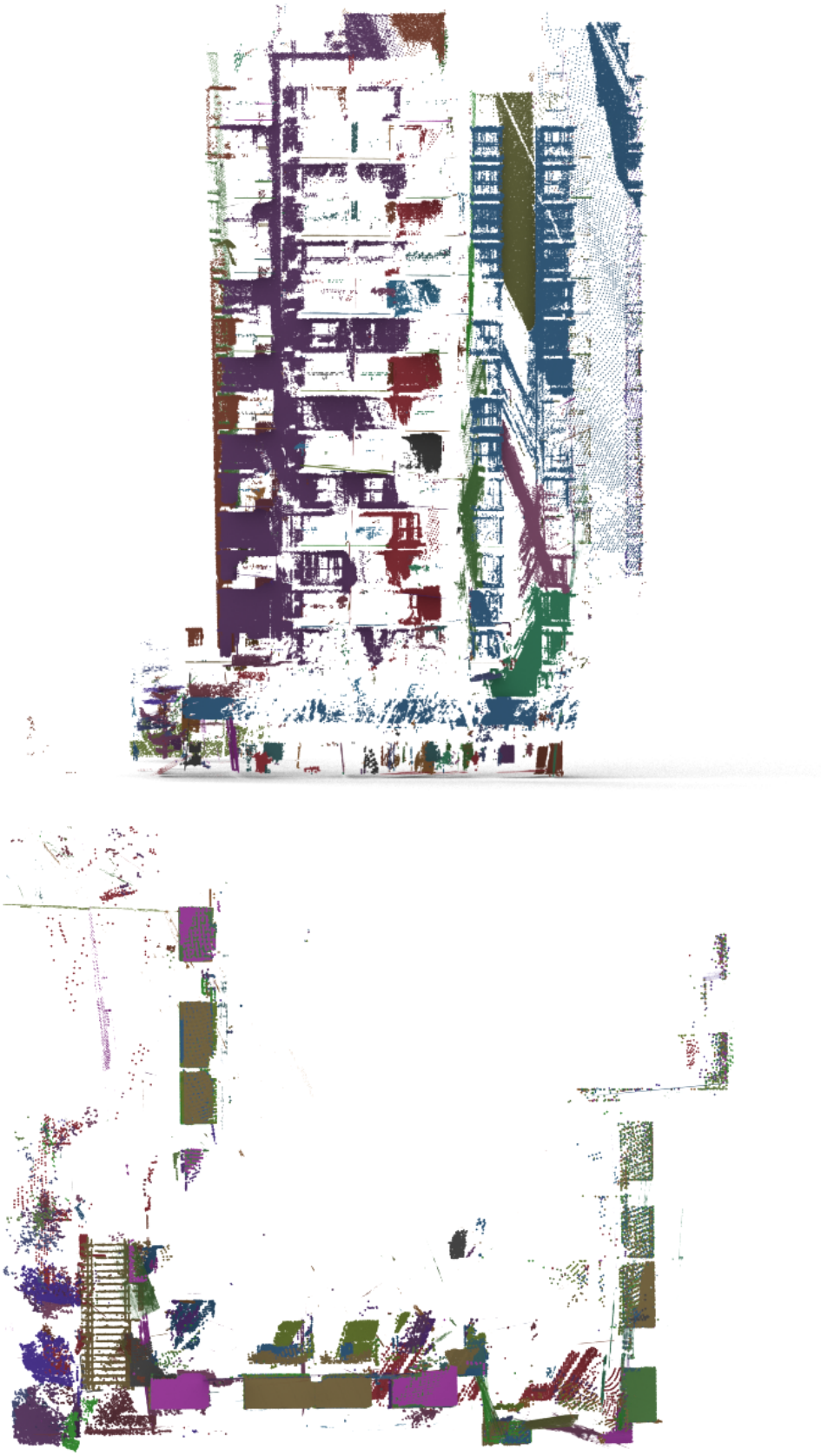

Figure 37: *Nola (Figure 11),* PEARL*: Front and top orthographic views of the reprojected cloud.*

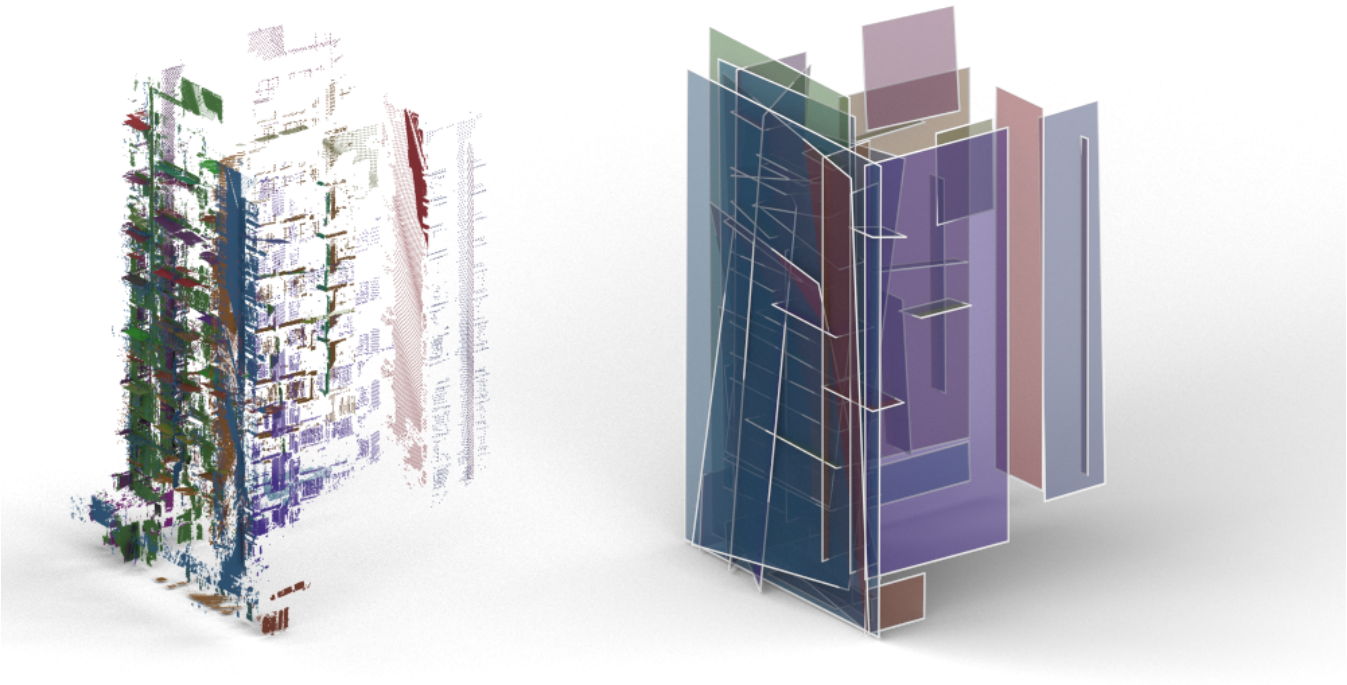

Figure 38: *Nola (Figure 11), RANSAC: Reprojected cloud and planar polygons.*

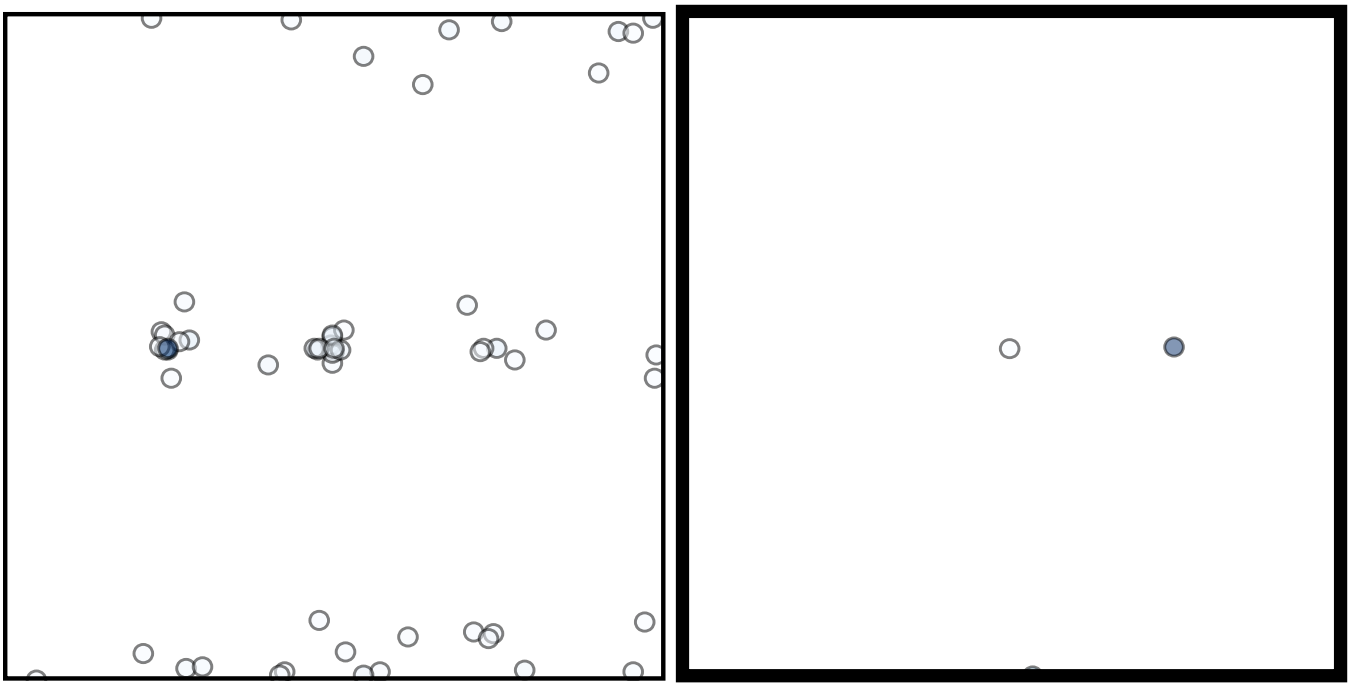

Figure 39: *Nola: RANSAC (left) and our (right) distributions.*

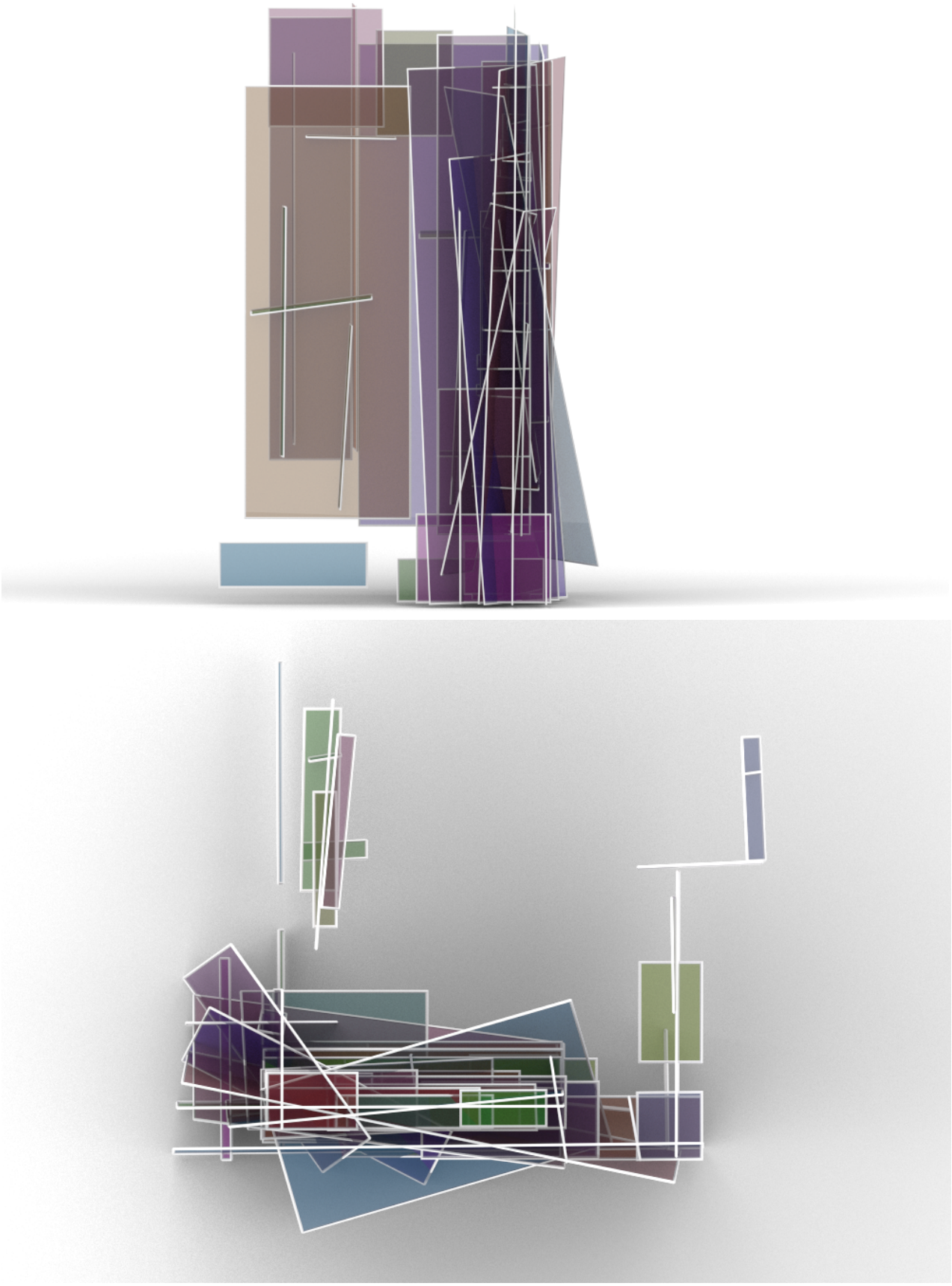

Figure 40: *Nola (Figure 11), RANSAC: Front and top orthographic views of the reprojected cloud.*

Lans

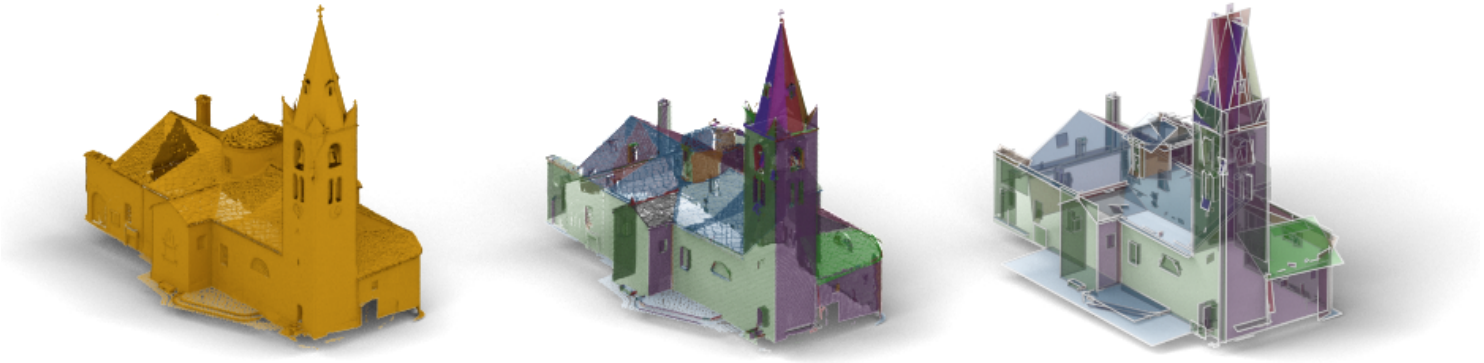

Figure 41: *Lans (Figure 12),* RAPTER*: From left to right: input cloud, reprojected cloud, planar polygons.*

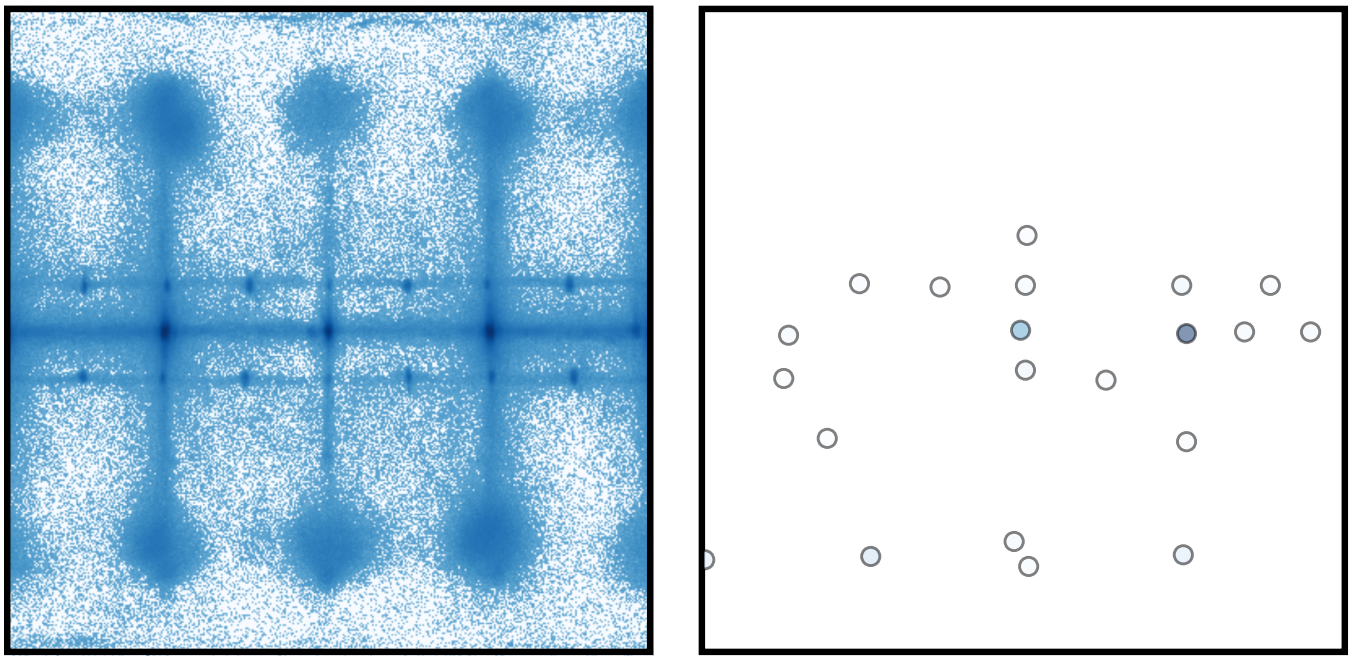

Figure 42: *Lans (Figure 12),* RAPTER*: Input and output distributions.*

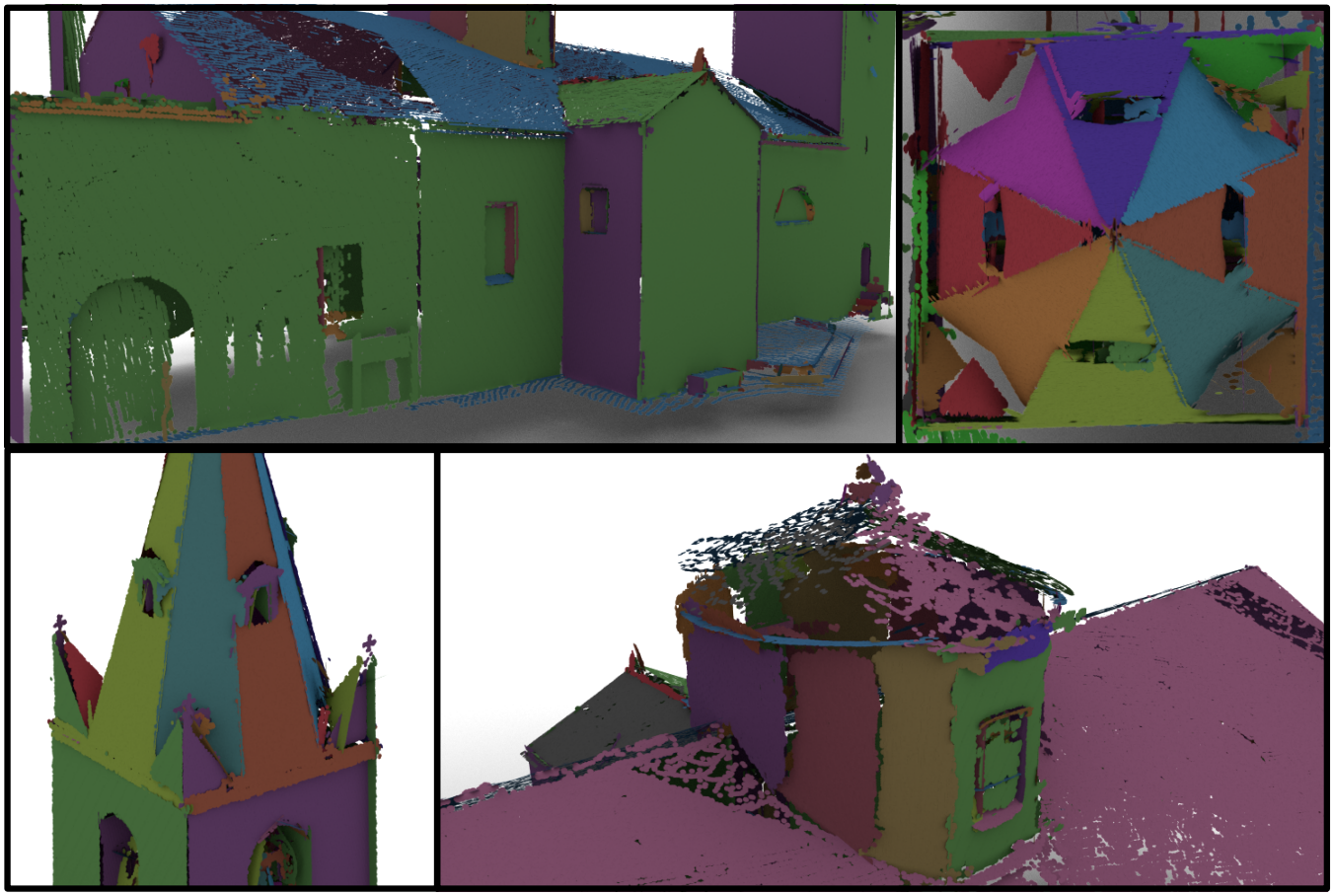

Figure 43: *Lans (Figure 12),* RAPTER*: Top orthographic views (top, side, front) of the planar polygons. Bottom: Close views of the reprojected cloud.*

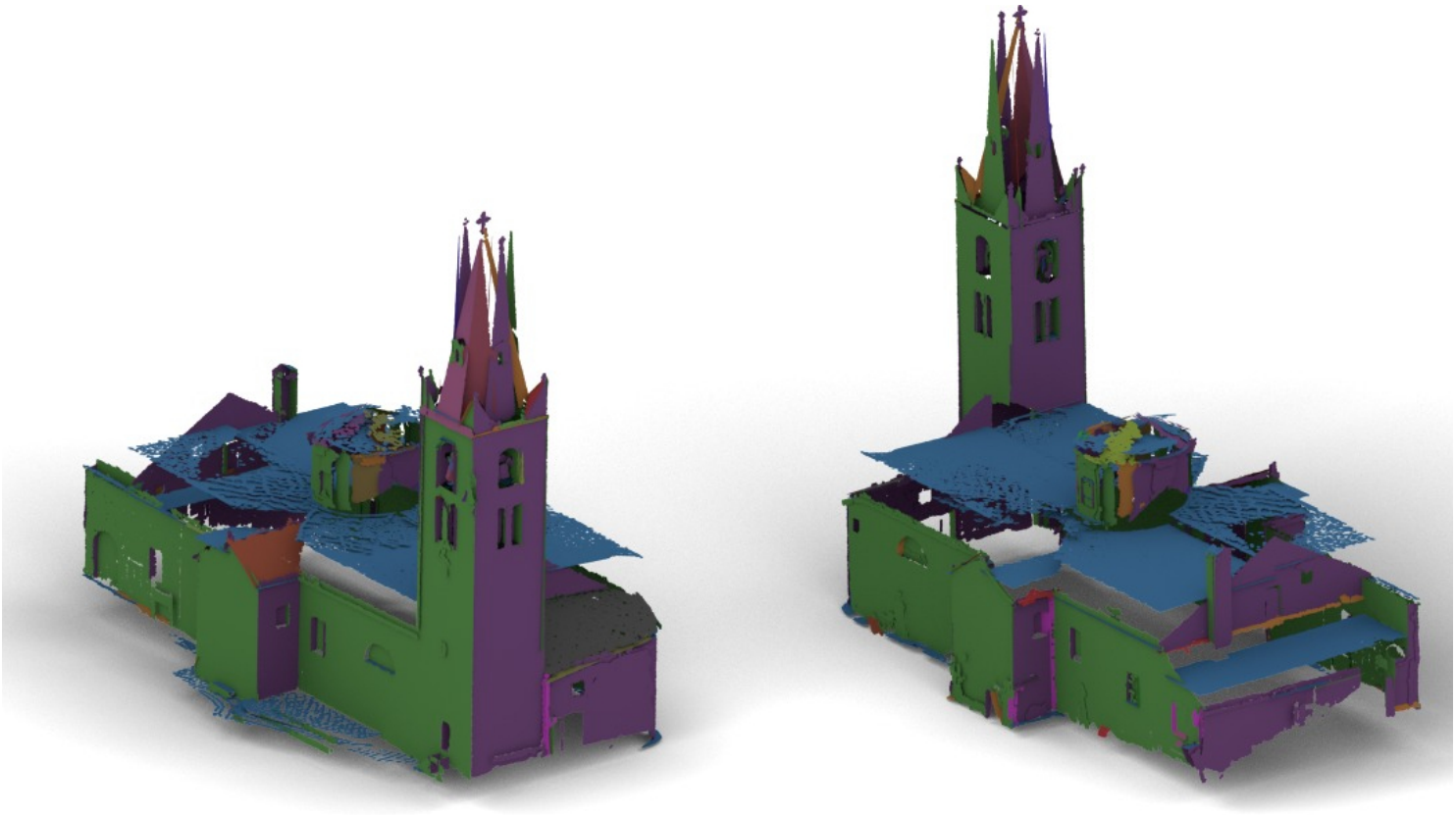

Figure 44: *Lans (Figure 12), GlobFit: Reprojected pointcloud front and back views.*

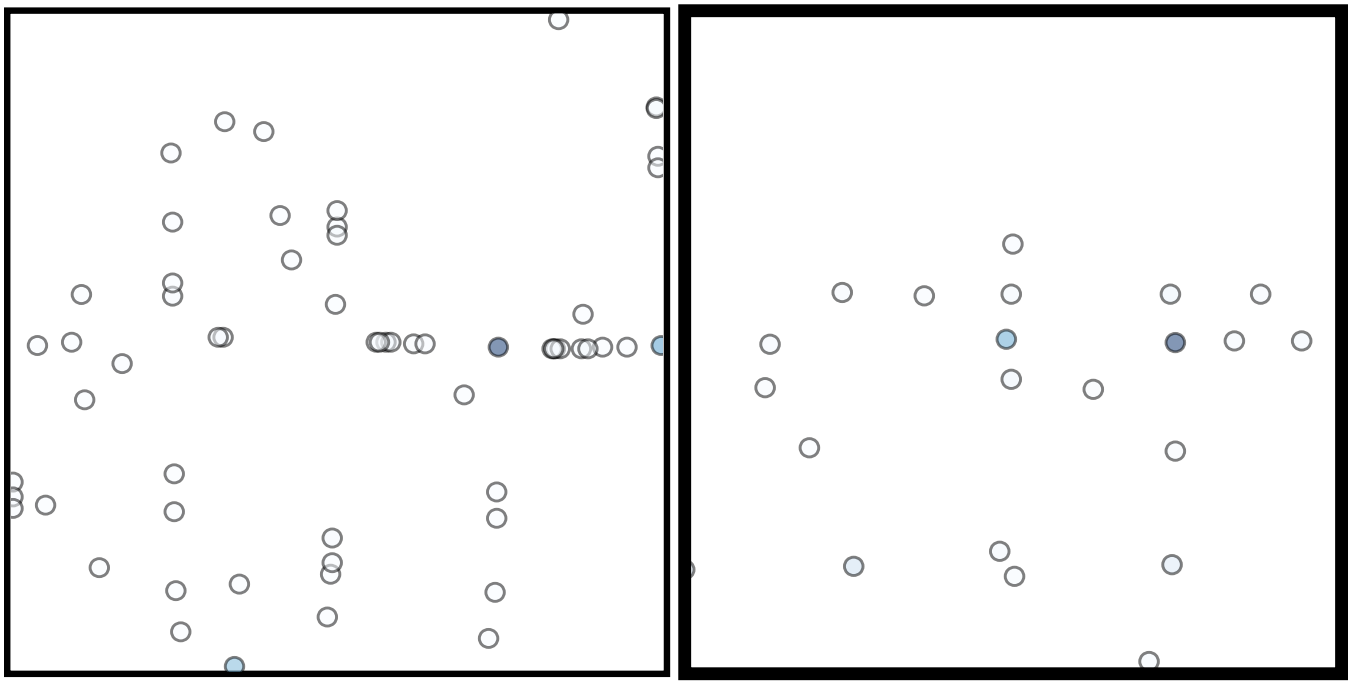

Figure 45: *Lans (Figure 12): Normal distributions of GlobFit (left) and* RAPTER *(right). GlobFit only had the largest (most supported) 300 out of 7441 input planes as input.*

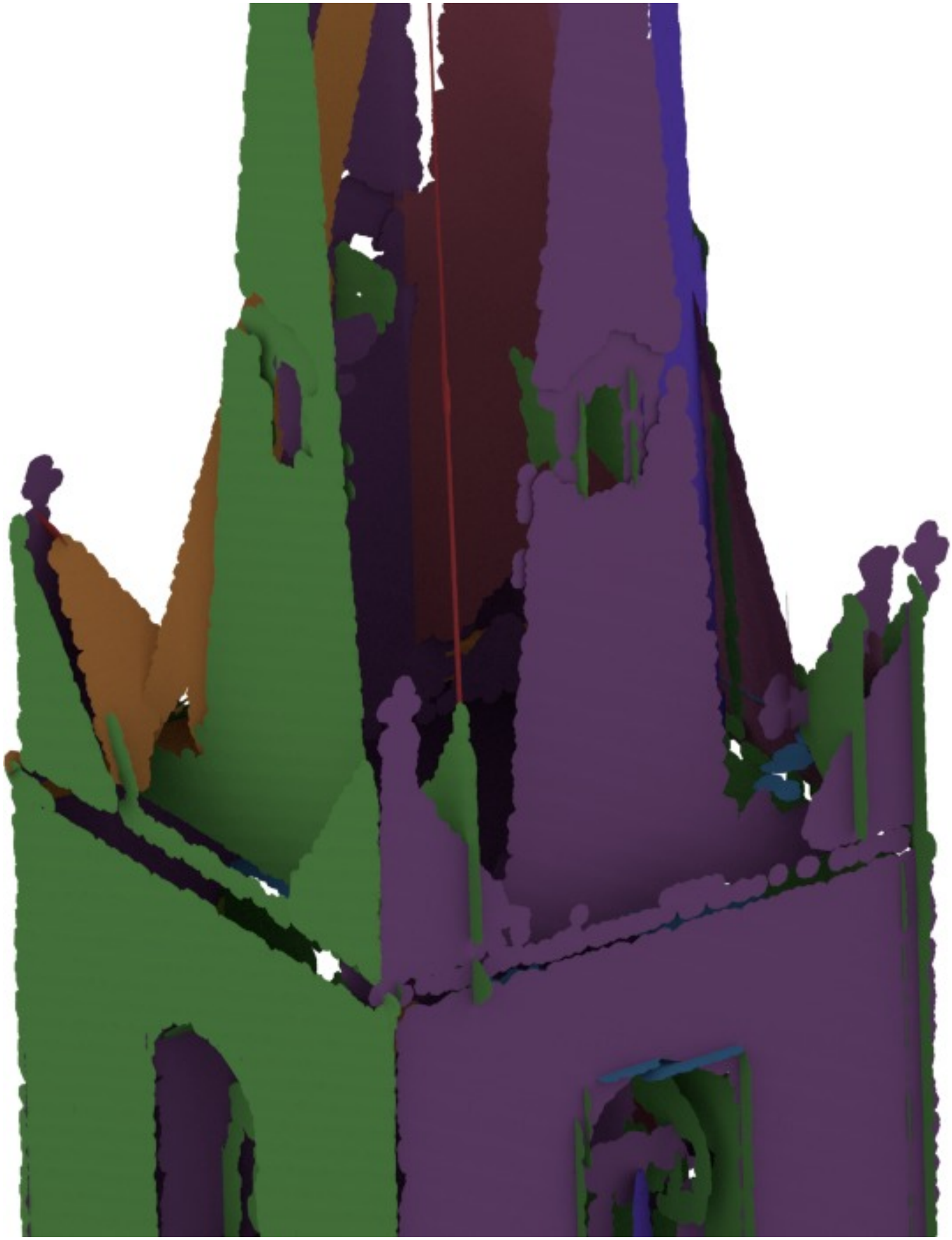

Figure 46: *Lans (Figure 12), GlobFit: Close view of reprojected pointcloud.*

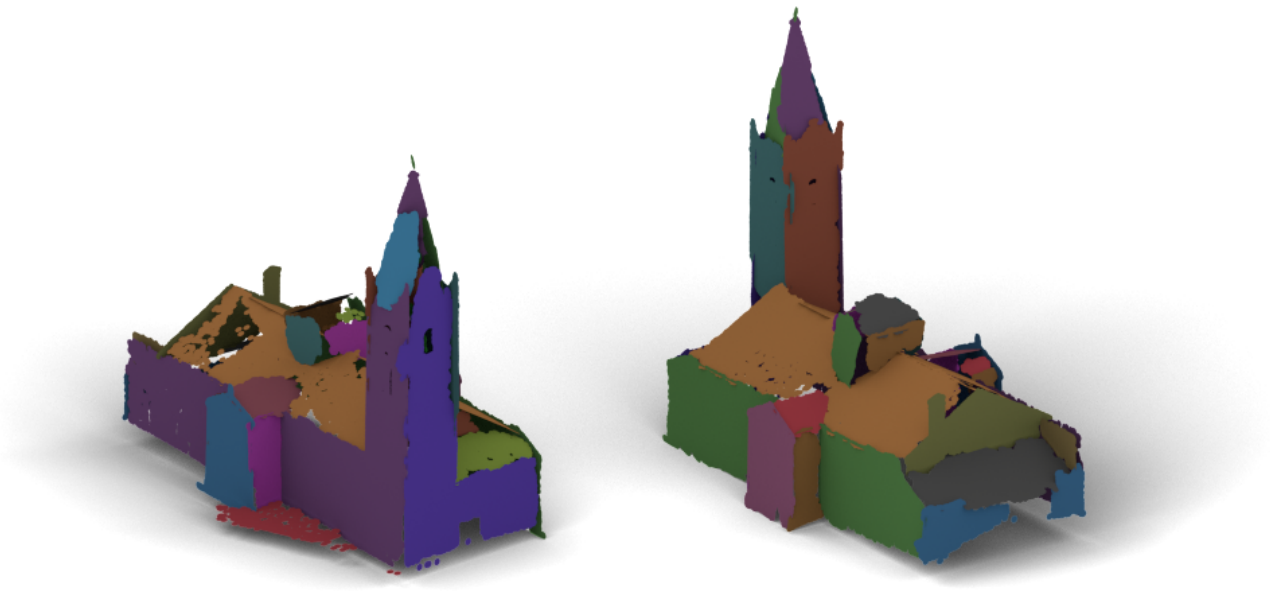

Figure 47: *Lans (Figure 12),* PEARL*: Reprojected cloud.* PEARL *worked with a subsampled (10%) pointcloud.*

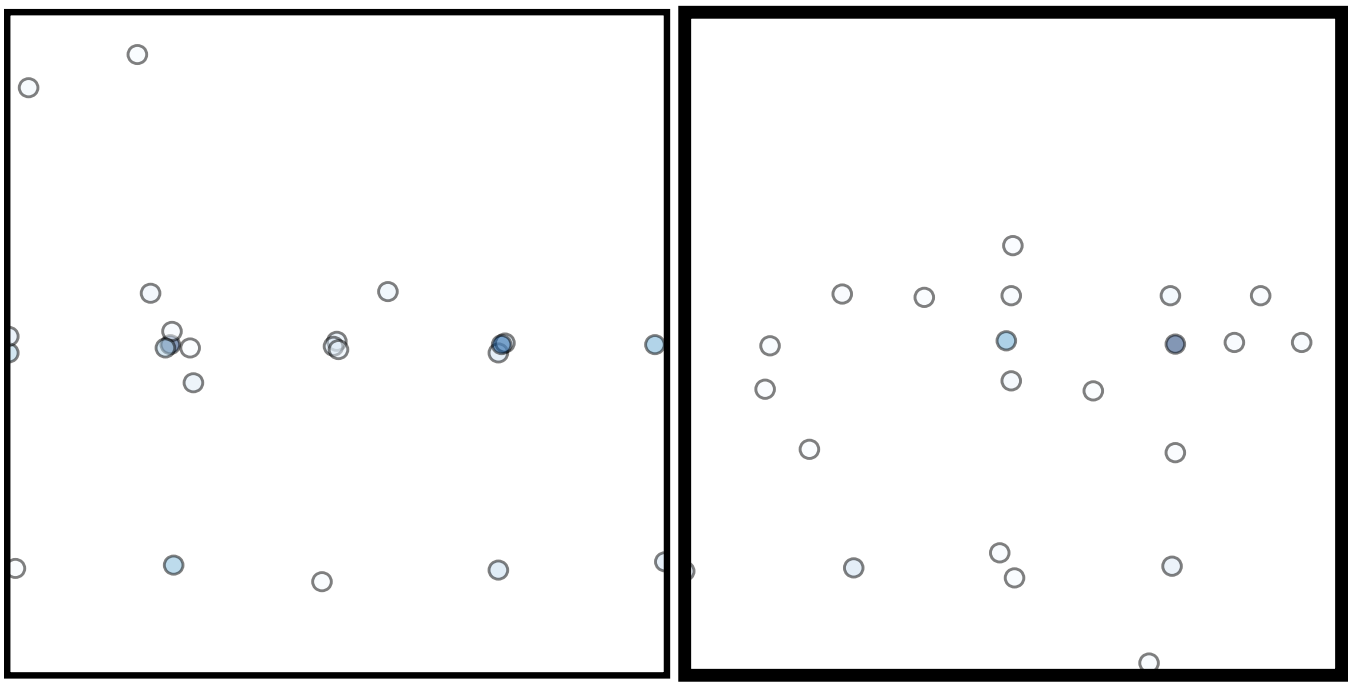

Figure 48: *Lans:* PEARL *(left) and our (right) distributions.*

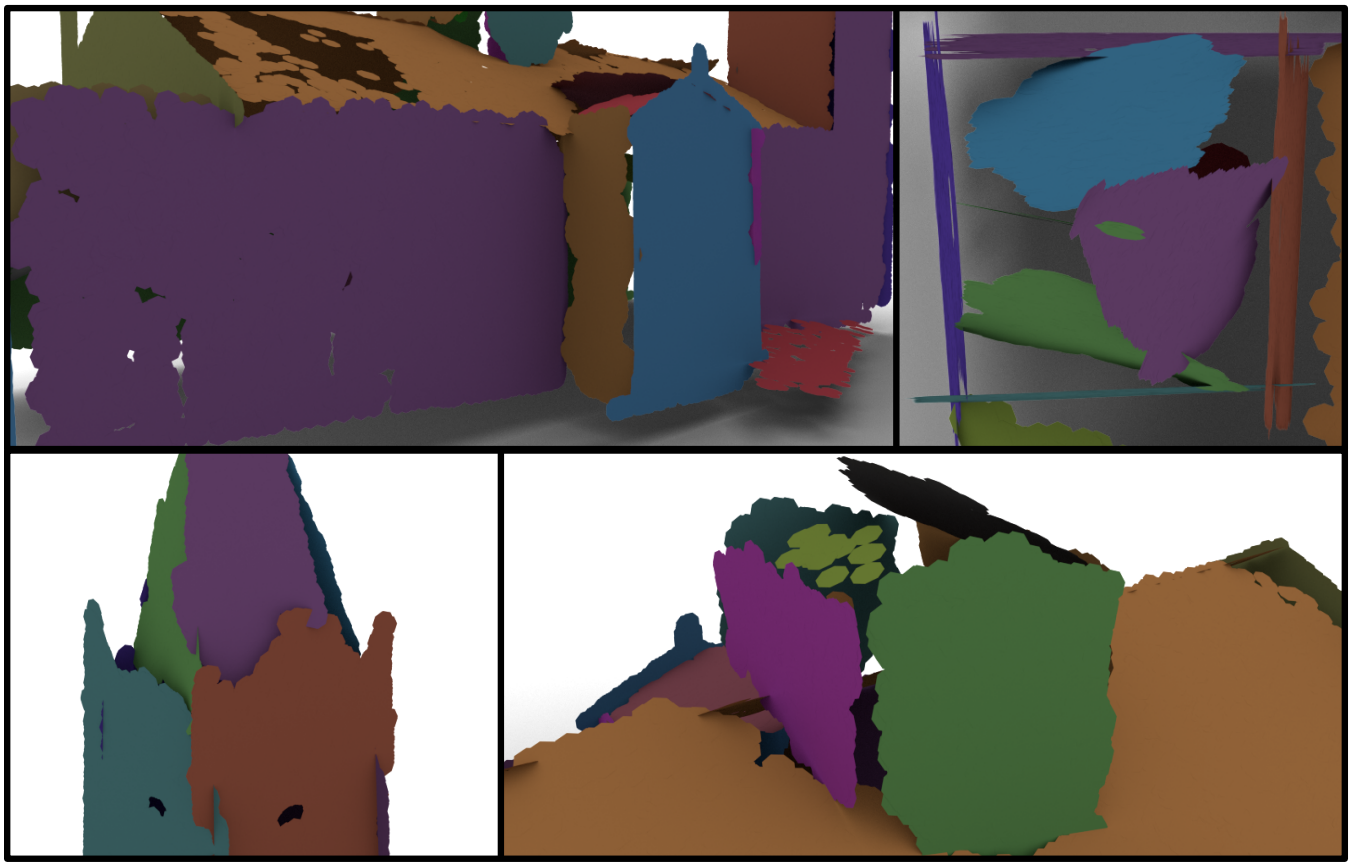

Figure 49: *Lans (Figure 12),* PEARL*: Close views of the reprojected cloud.*

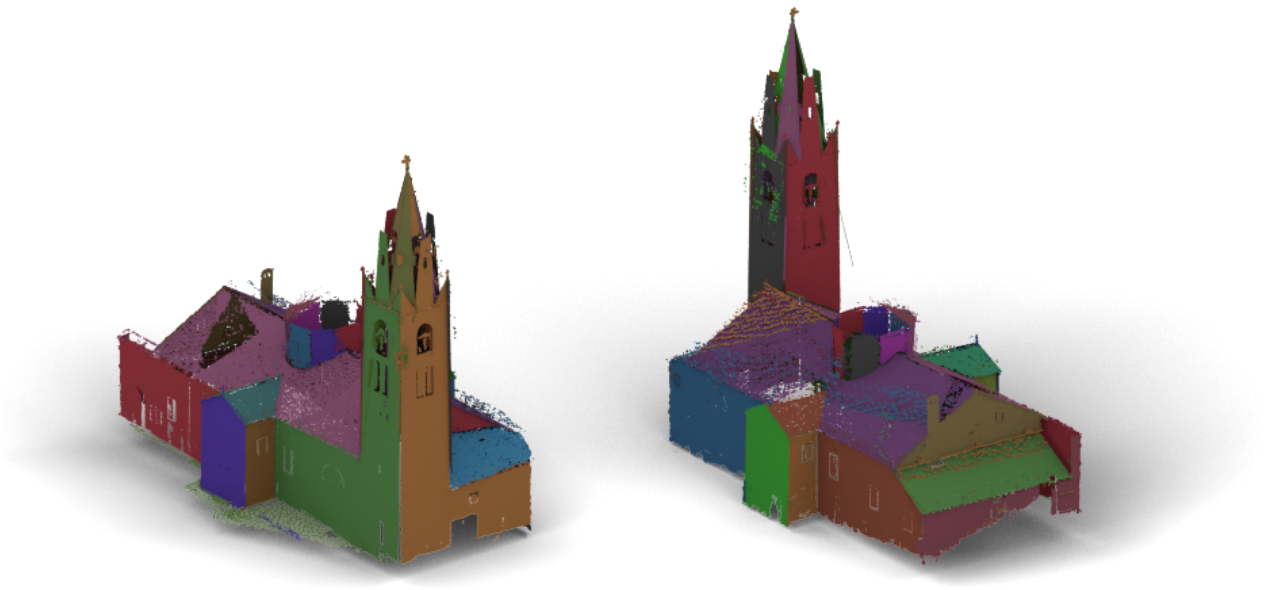

Figure 50: *Lans (Figure 12), RANSAC: Reprojected cloud.*

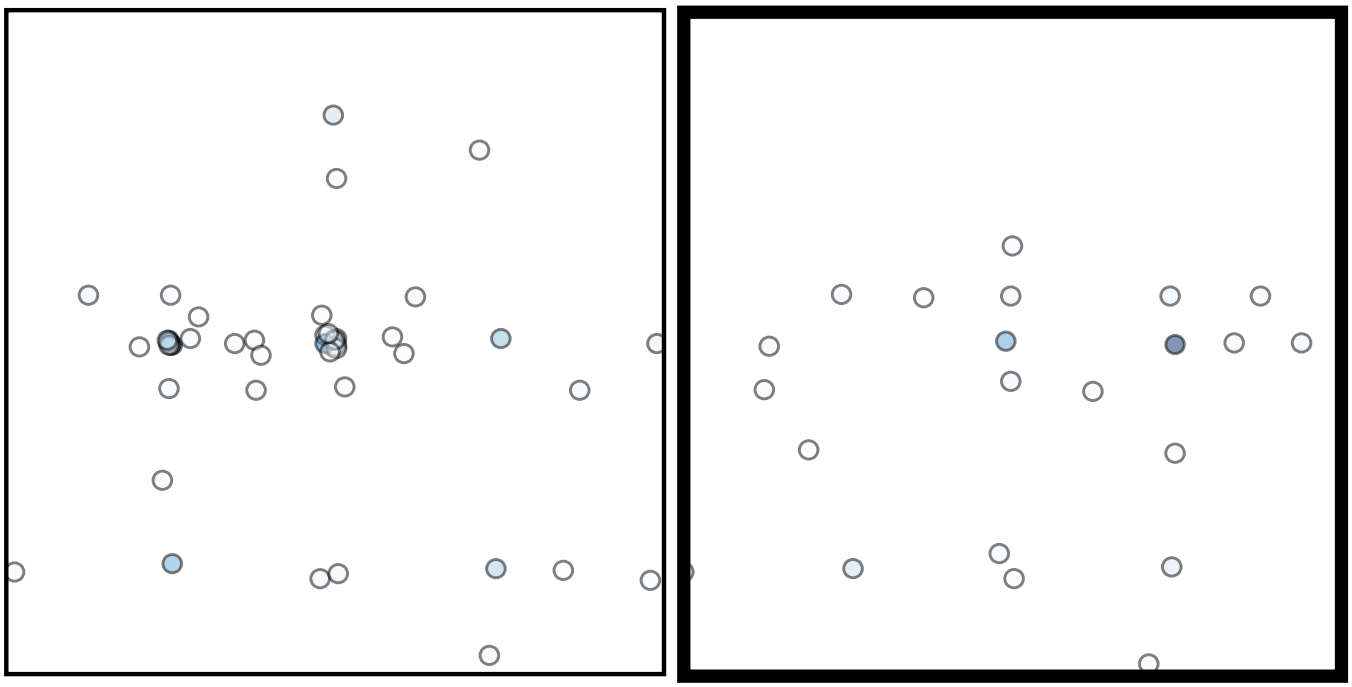

Figure 51: *Lans: RANSAC (left) and our (right) distributions.*

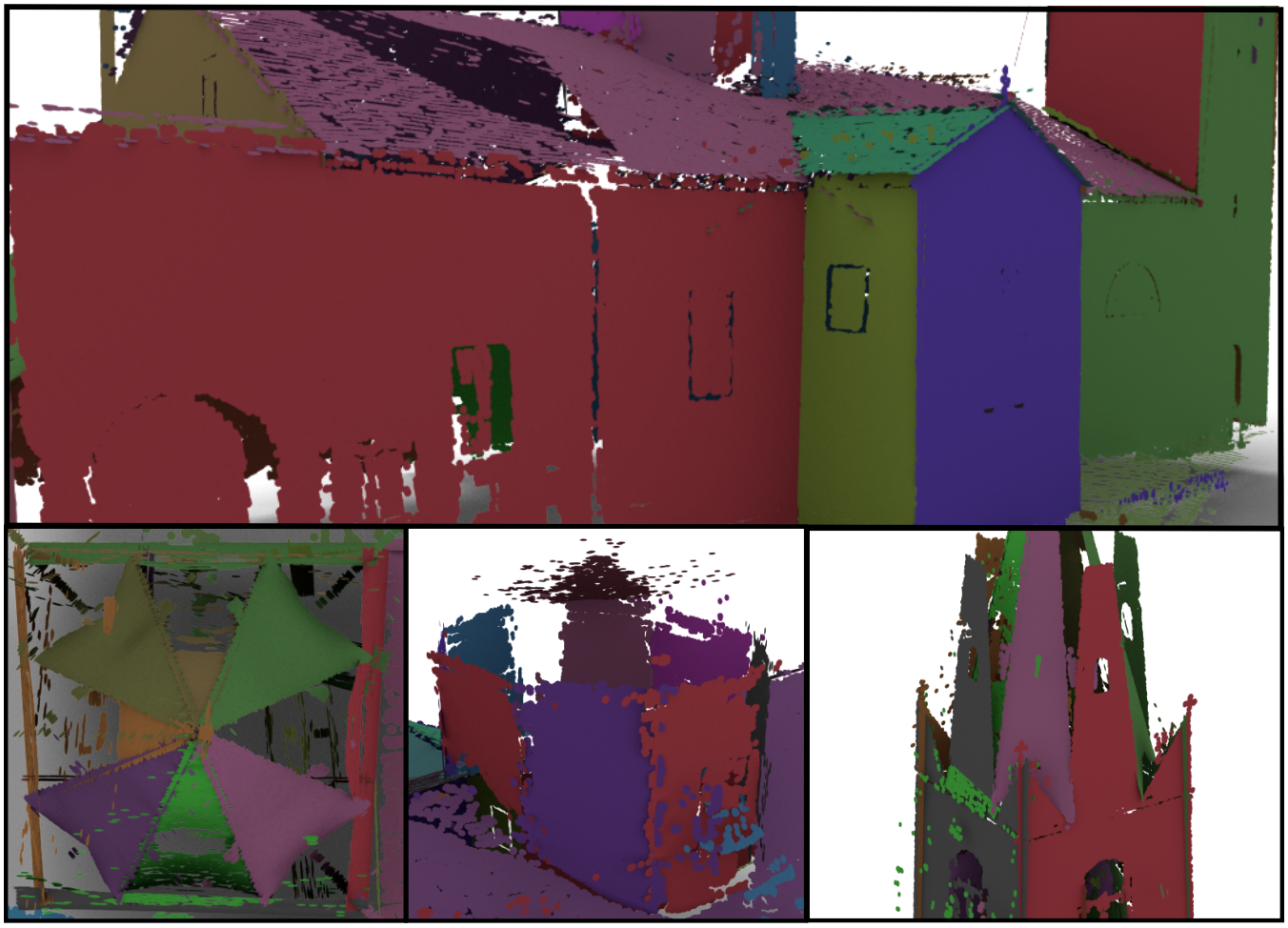

Figure 52: *Lans (Figure 12), RANSAC: Close views of the reprojected cloud.*

Stairs

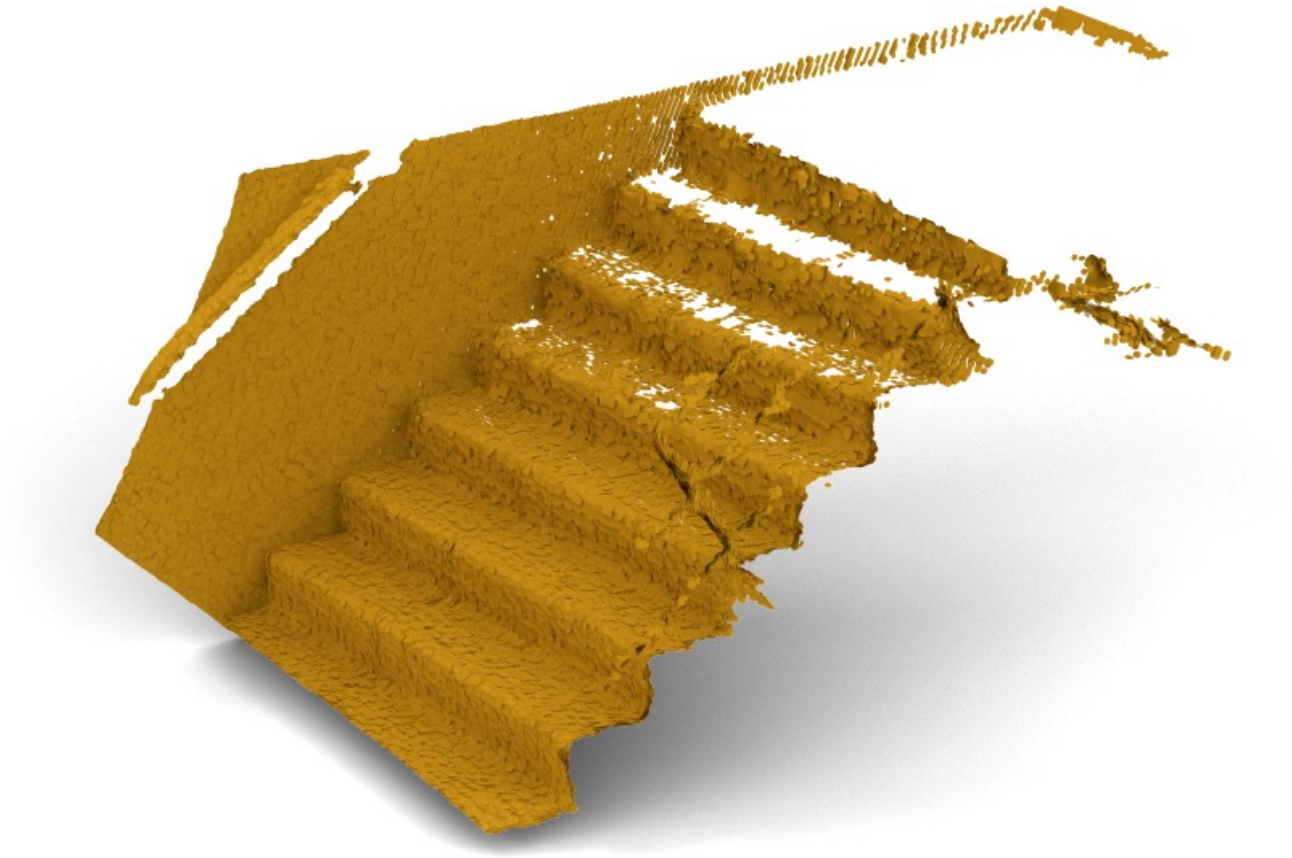

Figure 53: *Stairs (Figure 8): Input pointcloud.*

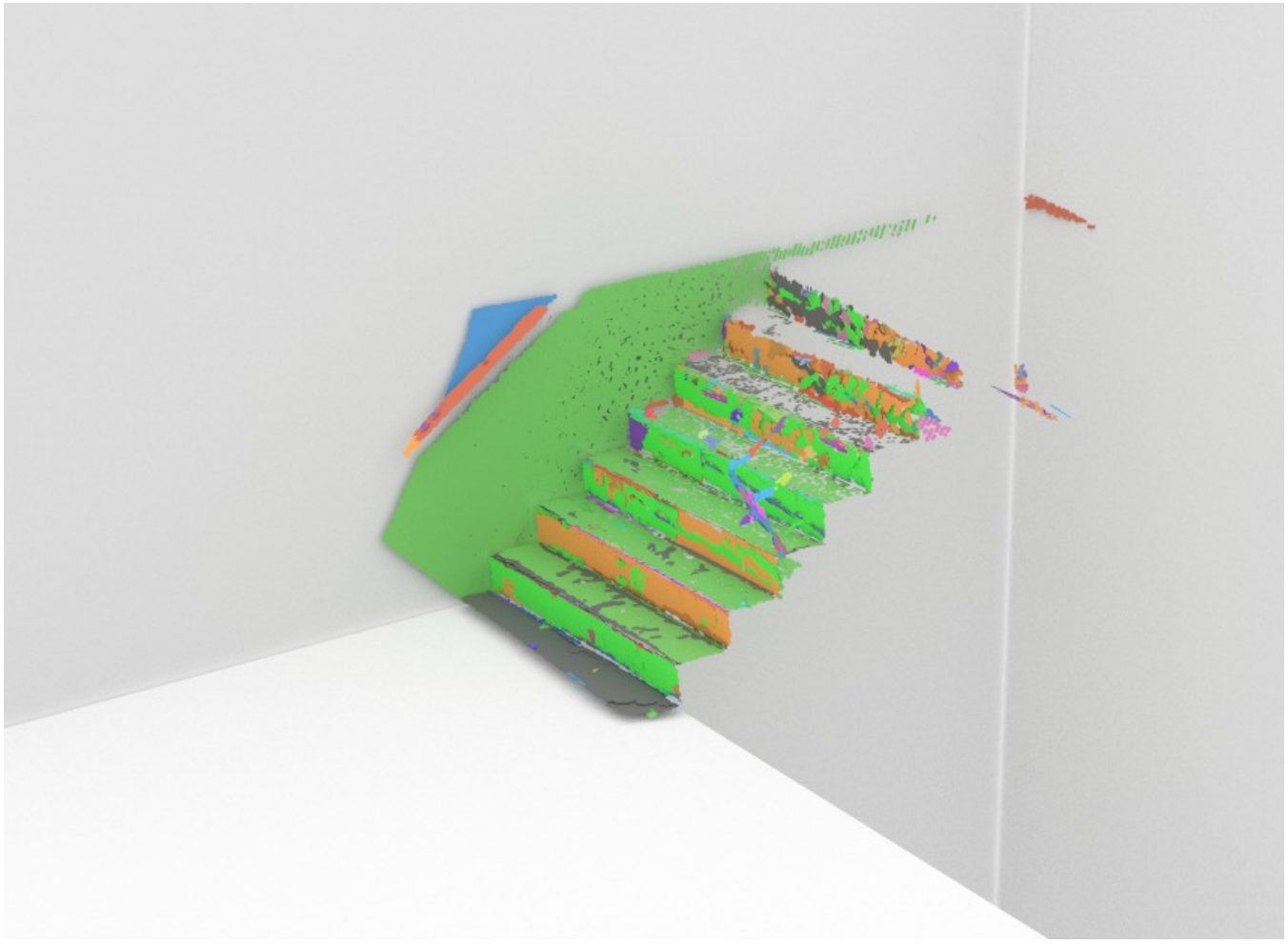

Figure 54: *Stairs (Figure 8): Reprojected pointcloud of 300 largest input planes.*

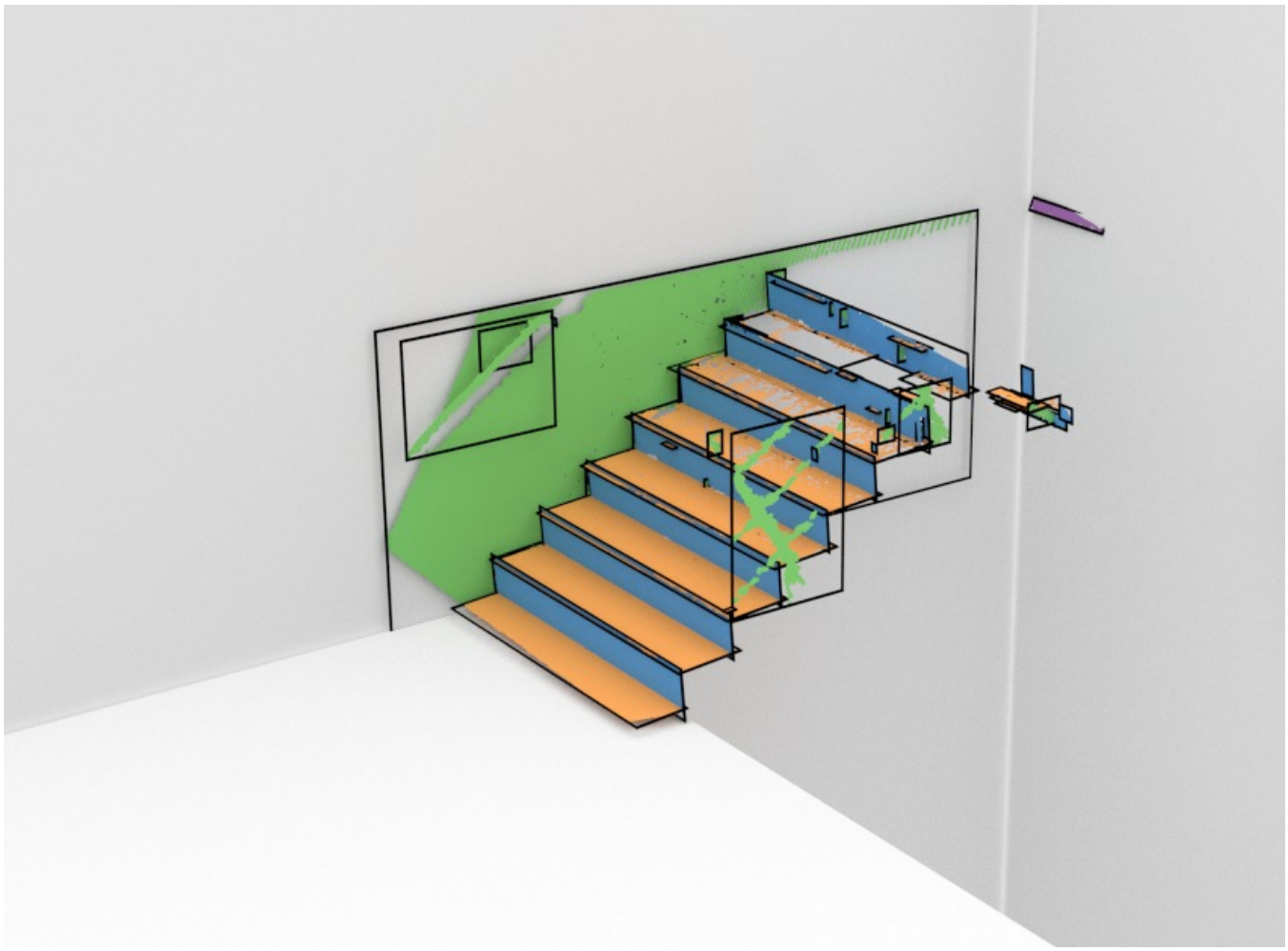

Figure 55: *Stairs (Figure 8),* RAPTER*: Output from largest 300 input planes.*

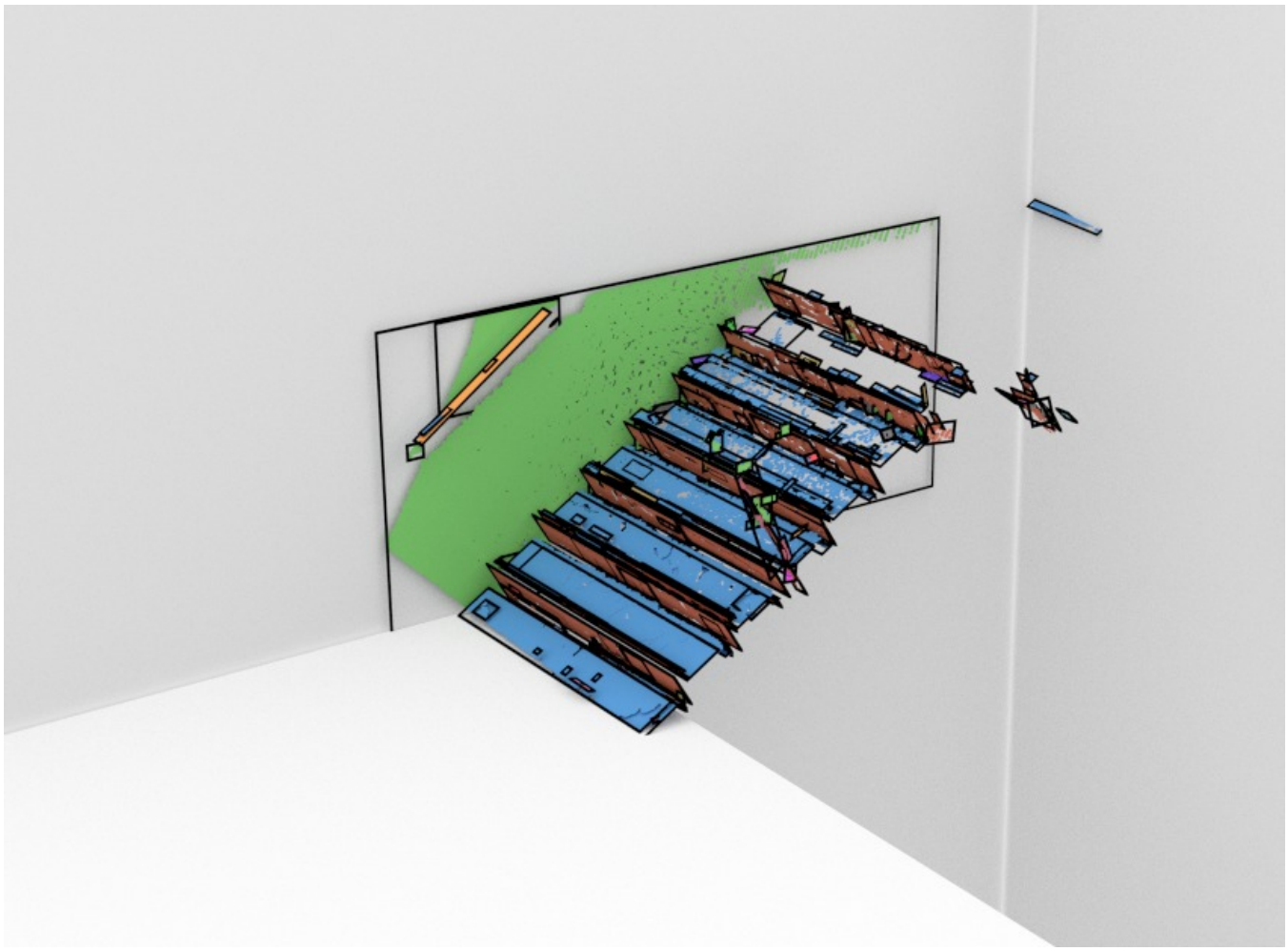

Figure 56: *Stairs (Figure 8), GlobFit: Output from largest 300 input planes.*

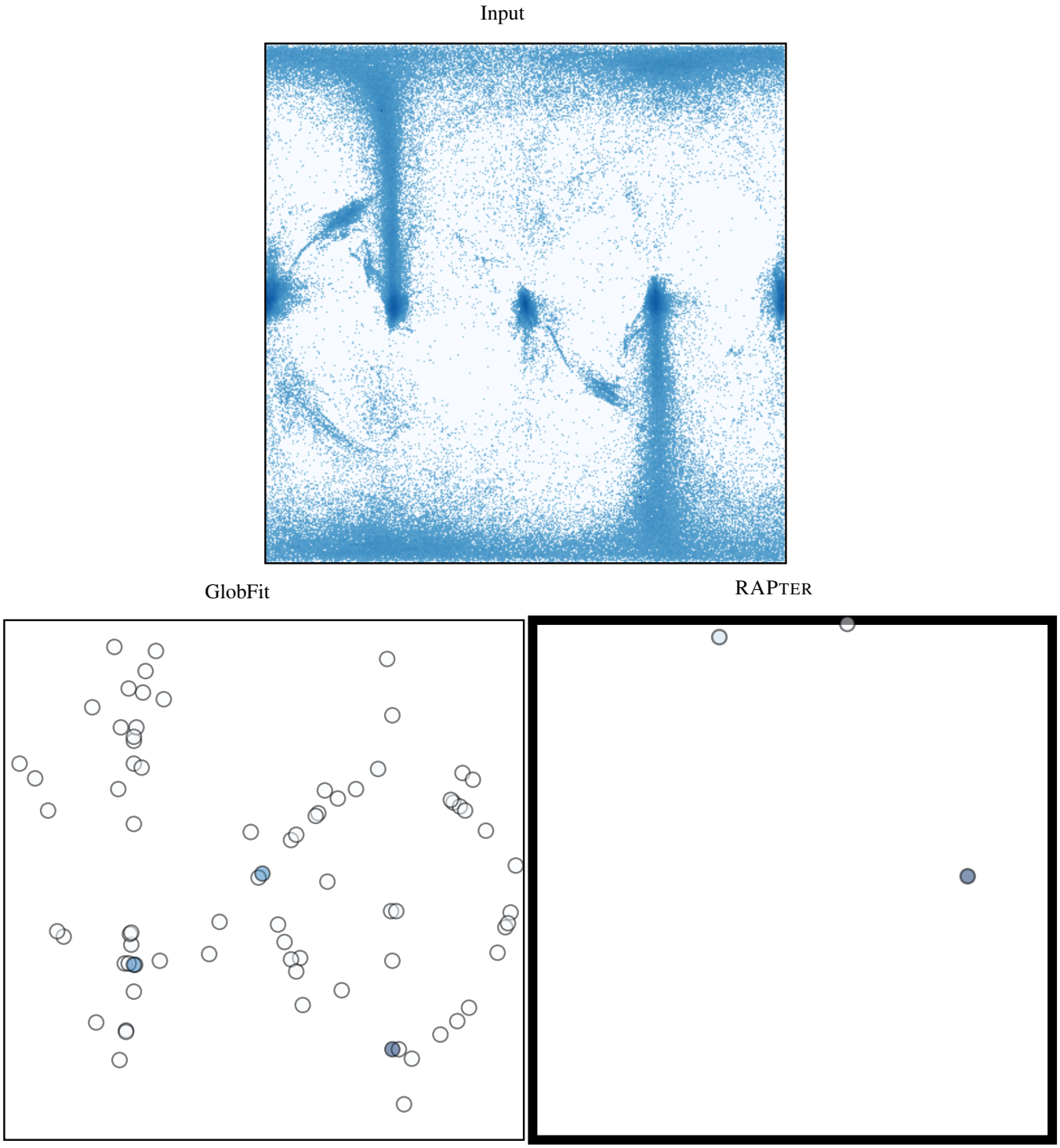

Figure 57: *Stairs (Figure 8) : Distributions of point normals. Input (top), GlobFit (left),* RAPTER *(right).*

L-house

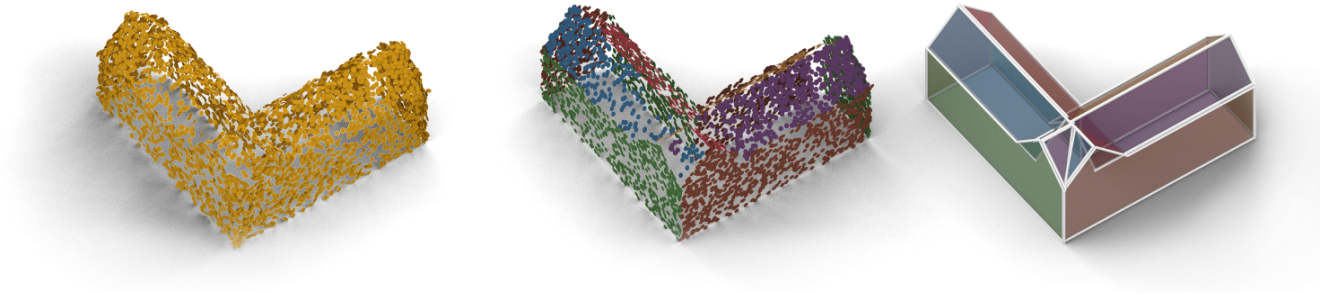

Figure 58: *L-house (Figure 9),* RAPTER*: From left to right: input cloud, reprojected cloud, planar polygons.*

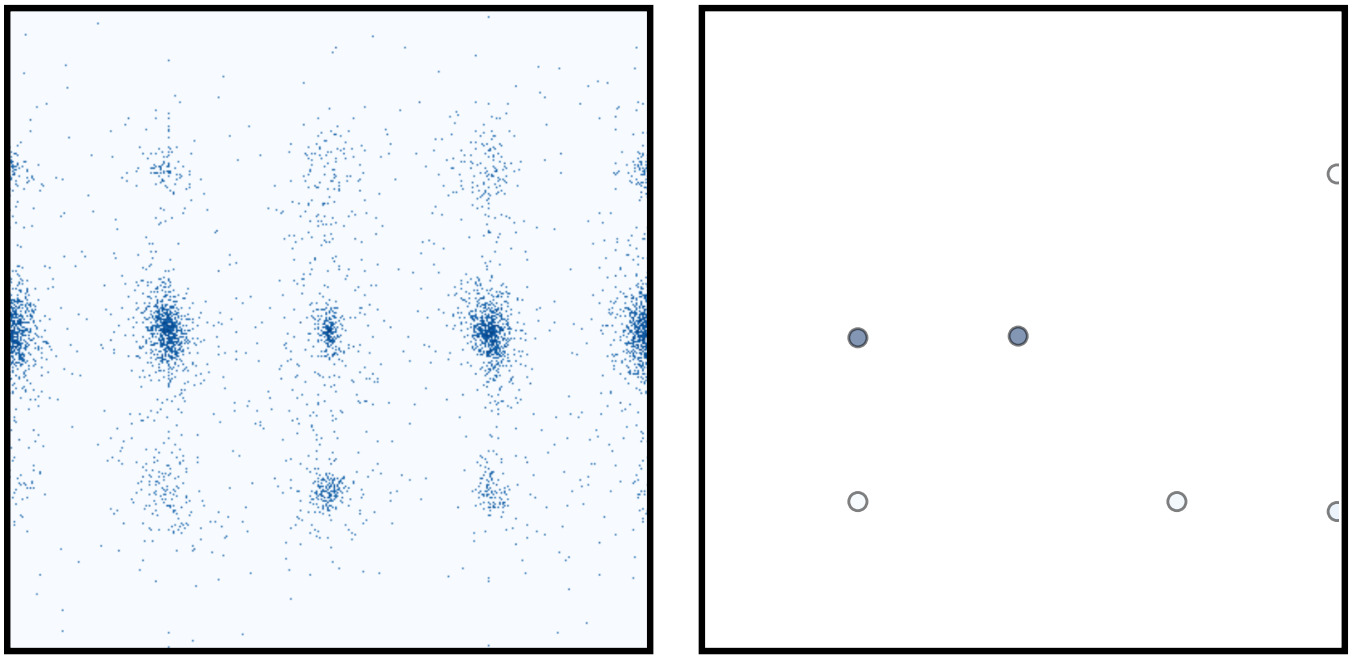

Figure 59: *L-house (Figure 9),* RAPTER*: Input and output distributions.*

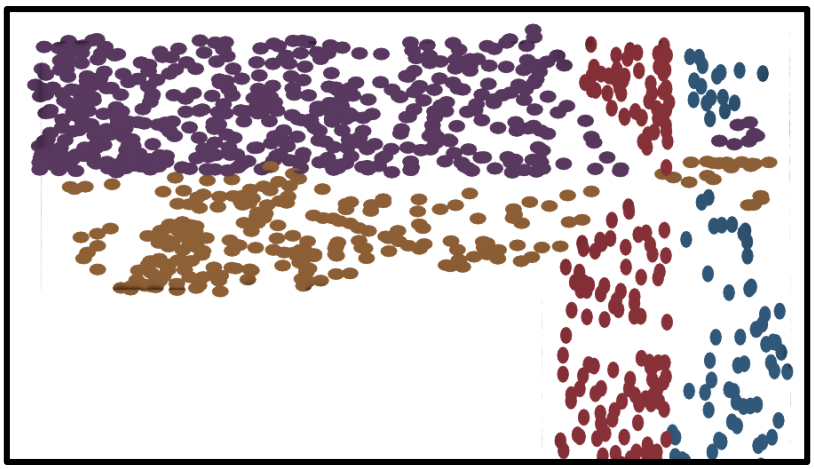

Figure 60: *L-house (Figure 9),* RAPTER*: Top orthographic view of the reprojected cloud.*

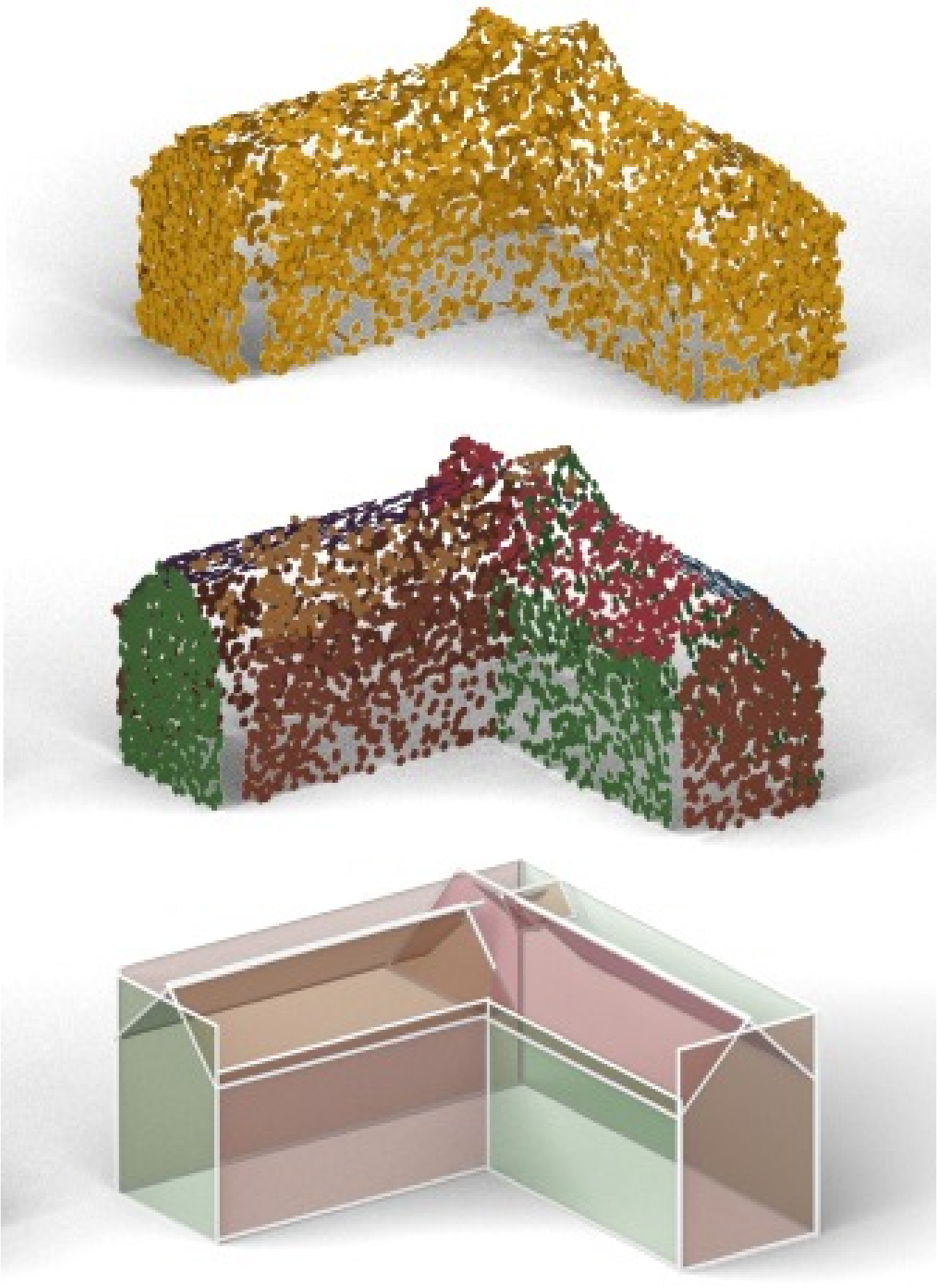

Figure 61: *L-house (Figure 9),* RAPTER*: From left to right: input cloud, reprojected cloud, planar polygons.*

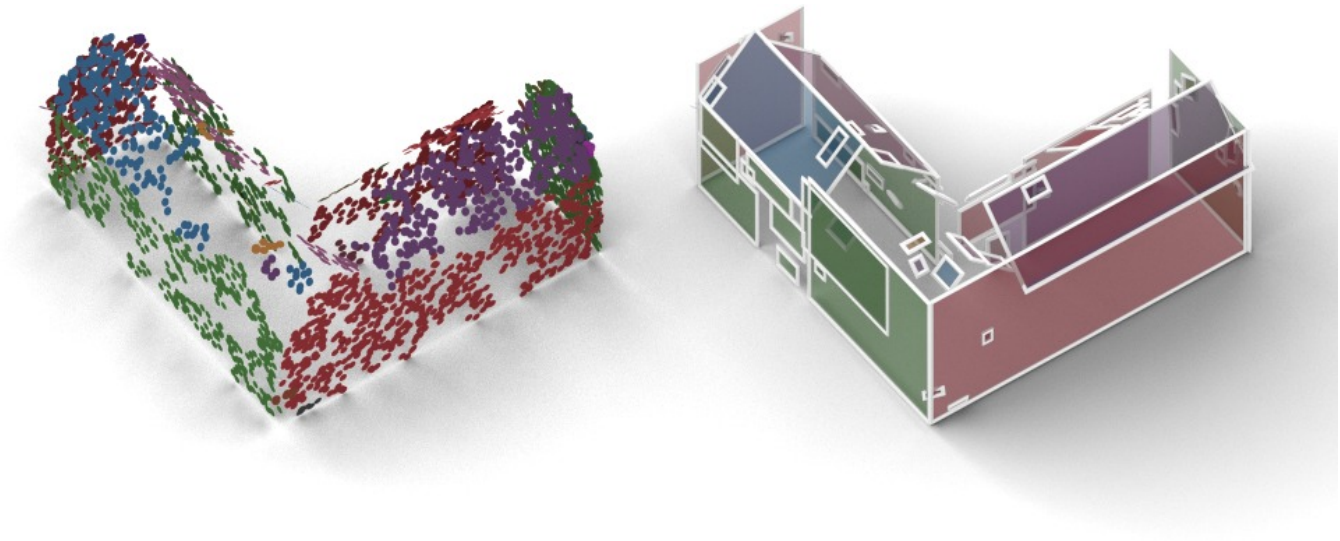

Figure 62: *L-house (Figure 9), GlobFit: Reprojected pointcloud and planar polygons.*

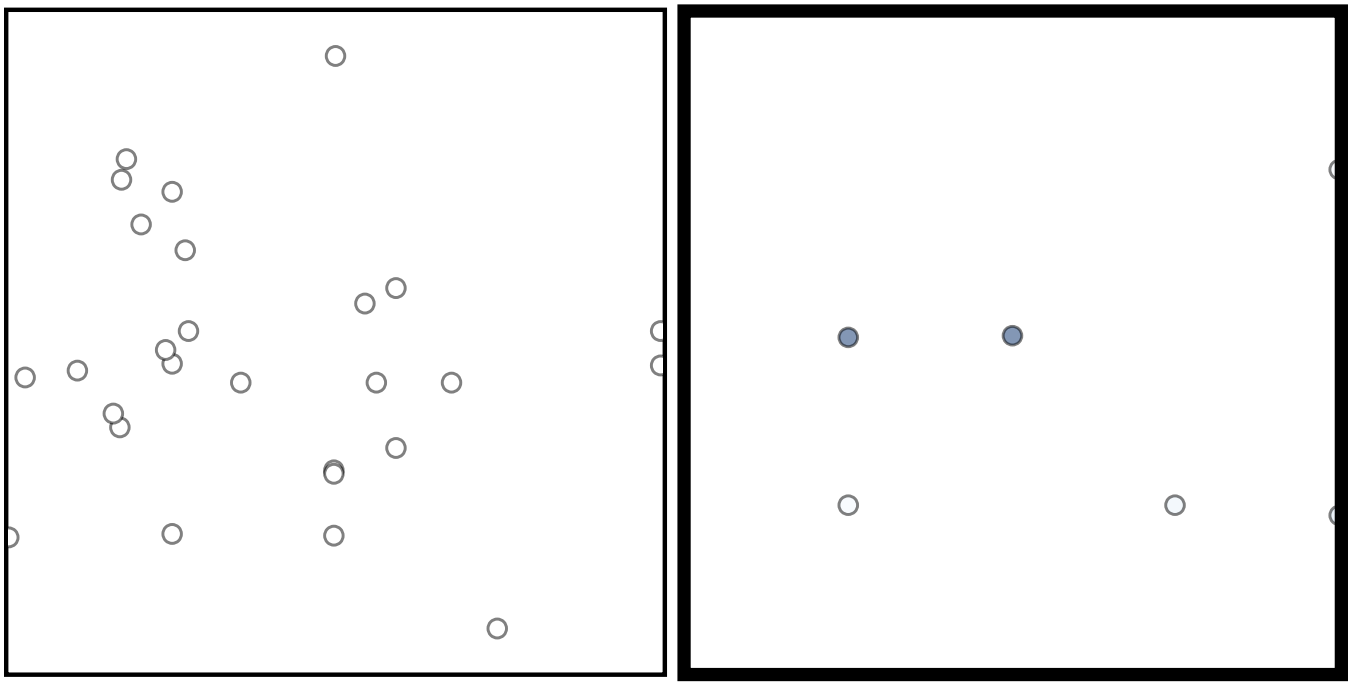

Figure 63: *L-house (Figure 9): Normal distributions of GlobFit (left) and* RAPTER *(right).*

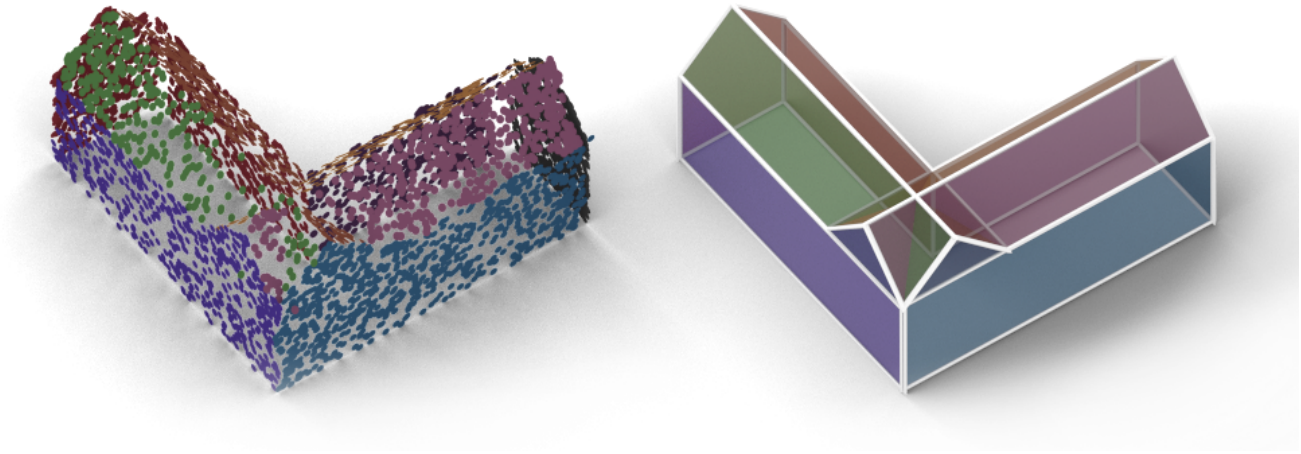

Figure 64: *L-house (Figure 9),* PEARL*: Reprojected cloud and planar polygons.*

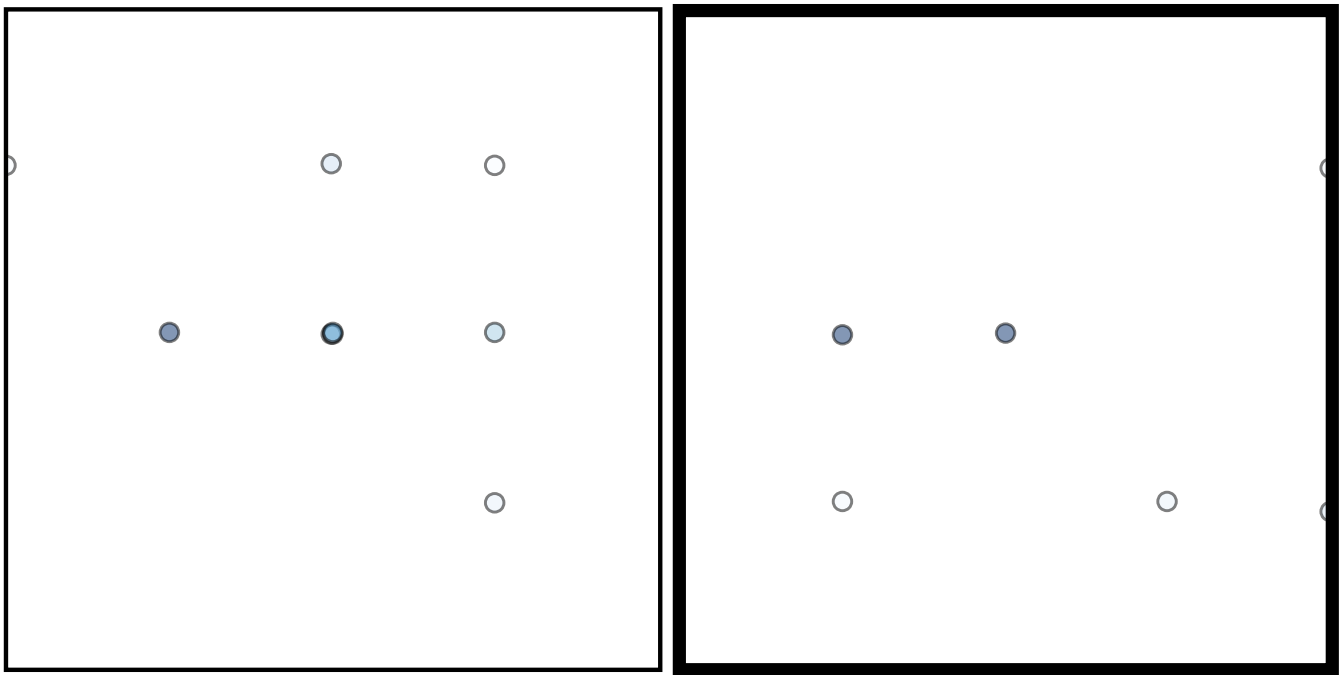

Figure 65: *L-house:* PEARL *(left) and our (right) distributions.*

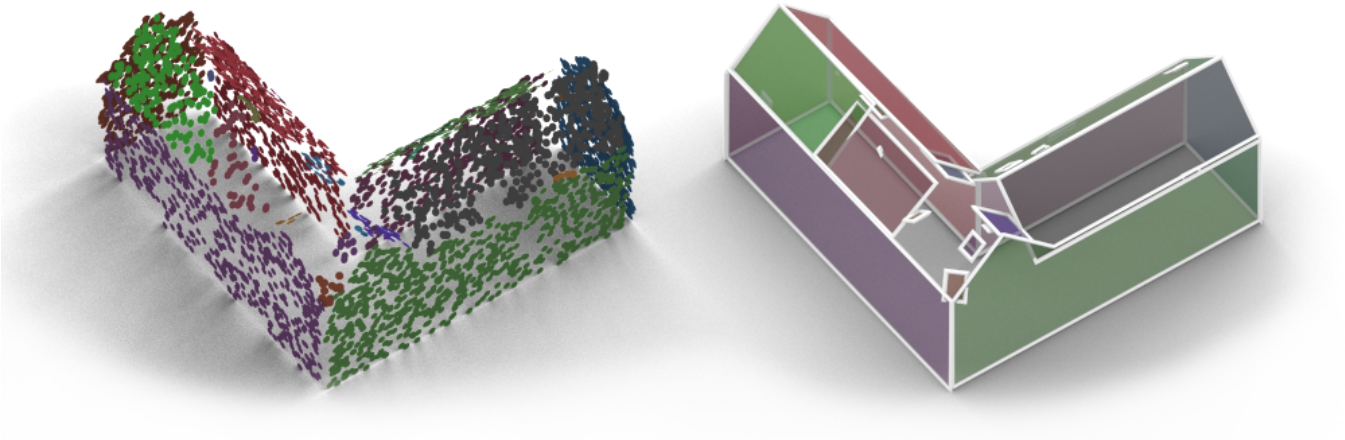

Figure 66: *L-house (Figure 9), RANSAC: Reprojected cloud and planar polygons.*

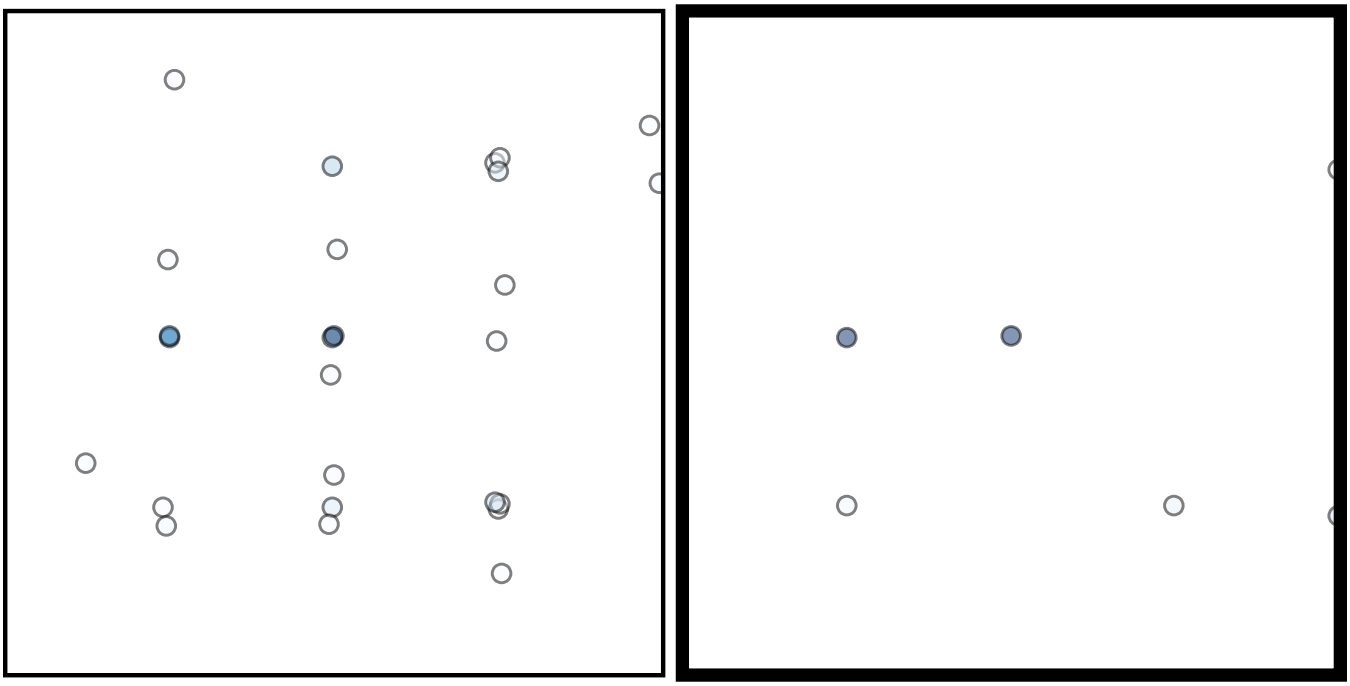

Figure 67: *L-house: RANSAC (left) and our (right) distributions.*