CIS580 Homework 5 Report

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1 1. (b). i

From the altered intrinsic matrix which accommodate for image rotation,

$$f_x \frac{X}{Z} + c_x = u$$
$$f_y \frac{Y}{Z} + c_y = v$$

Since the images are rotated clockwise for 90 degrees, the feature locations offset in v direction. For the left and right images,

$$f_y \frac{Y_i}{Z} + c_{yi} = v_L$$
$$f_y \frac{Y_j - B}{Z} + c_{yj} = v_R$$
$$v_L - v_R = f_y \frac{Y_i}{Z} + c_{yi} - f_y \frac{Y_j - B}{Z} - c_{yj}$$
$$v_L - v_R = f_y \frac{B}{Z} + c_{yi} - c_{yj}$$
$$d = v_L - v_R + c_{yj} - c_{yi} = f_y \frac{B}{Z}$$

2 1. (b). v

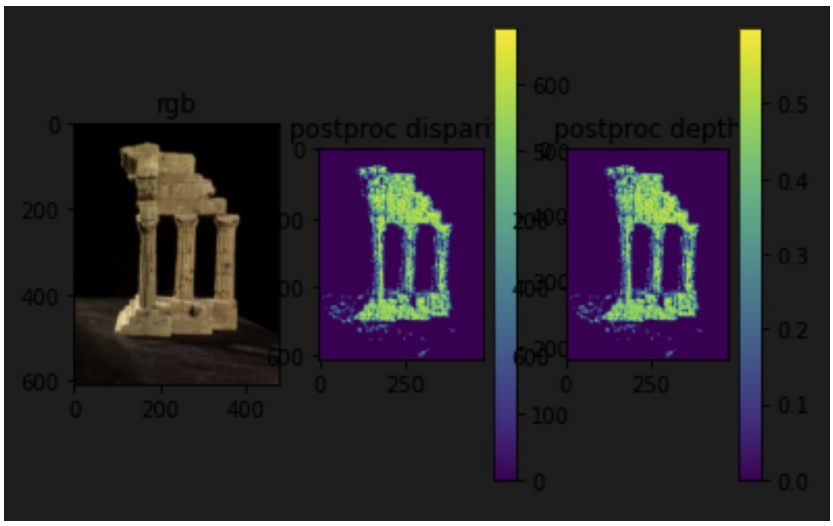

Figure 1: consistency mask

The implemented two view stereo algorithm can't handle textureless region, like the background and desktop region. Therefore, we apply the uniqueness constraint (L-R constraint) to filter out those invalid disparities in computation.

3 1.(e)

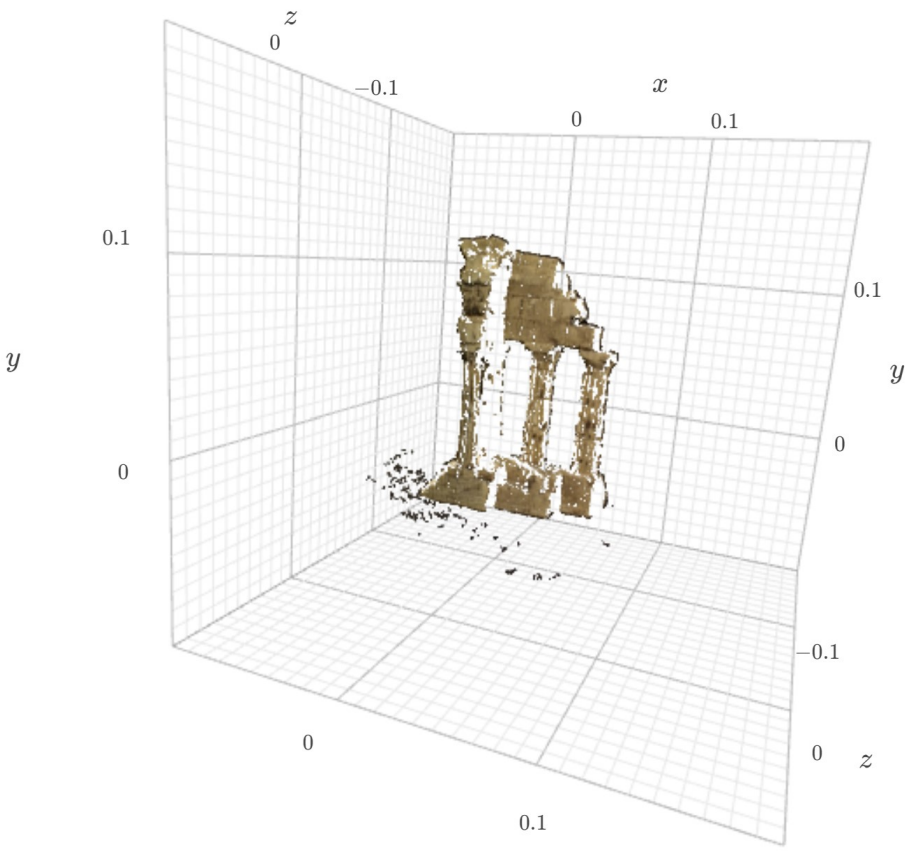

Figure 2: Two View Reconstruction with SSD kernel

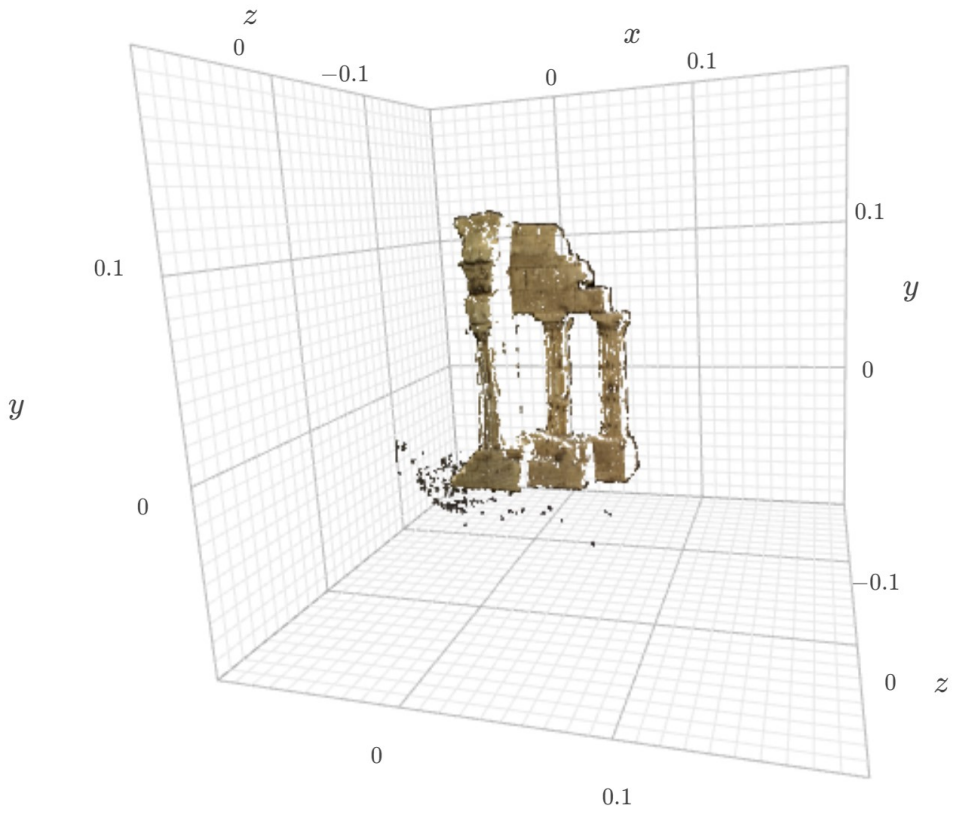

Figure 3: Two View Reconstruction with SAD kernel

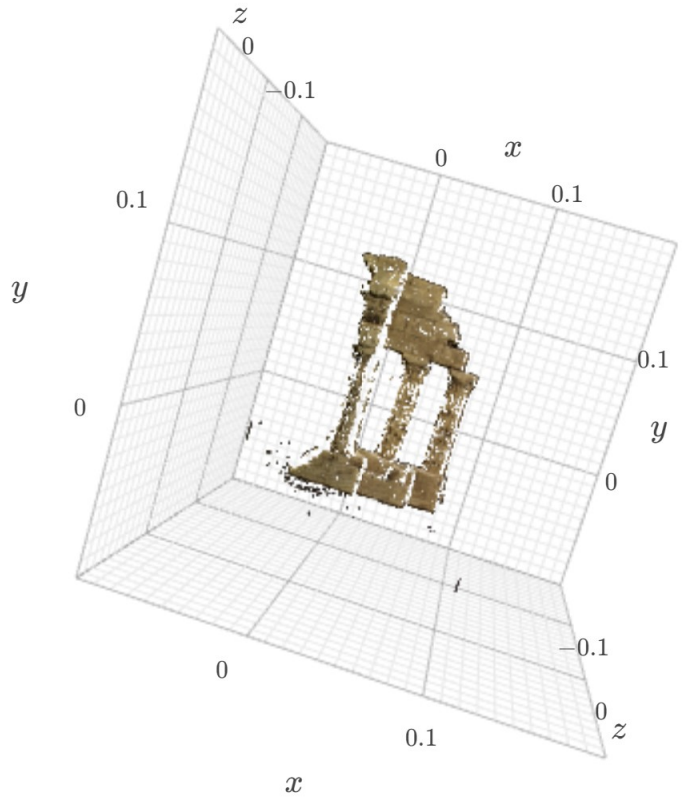

Figure 4: Two View Reconstruction with ZNCC kernel

4 1.(f)

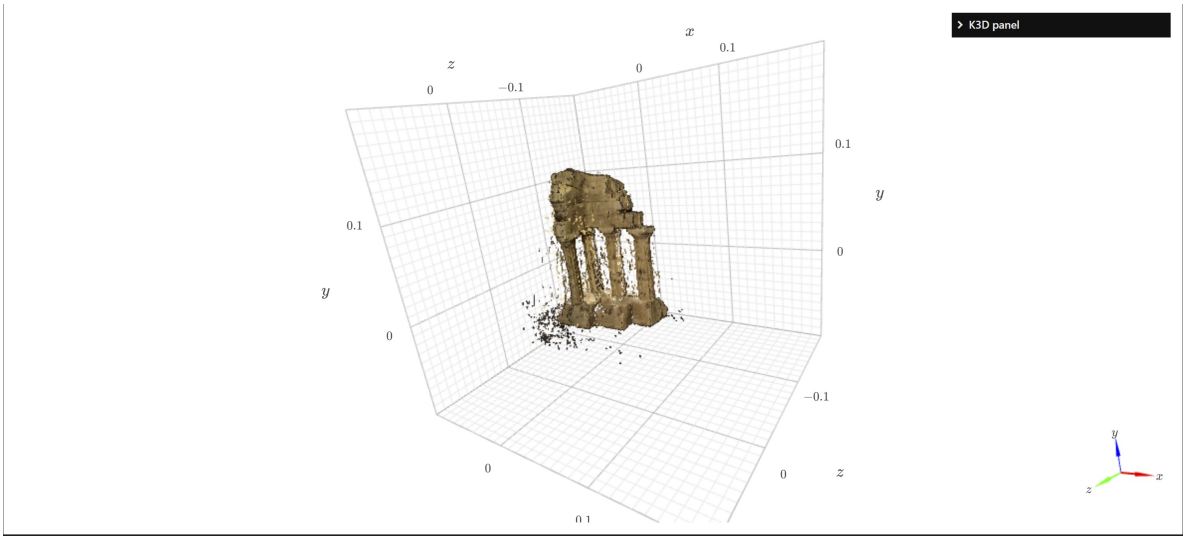

Figure 5: Two View Full Reconstruction