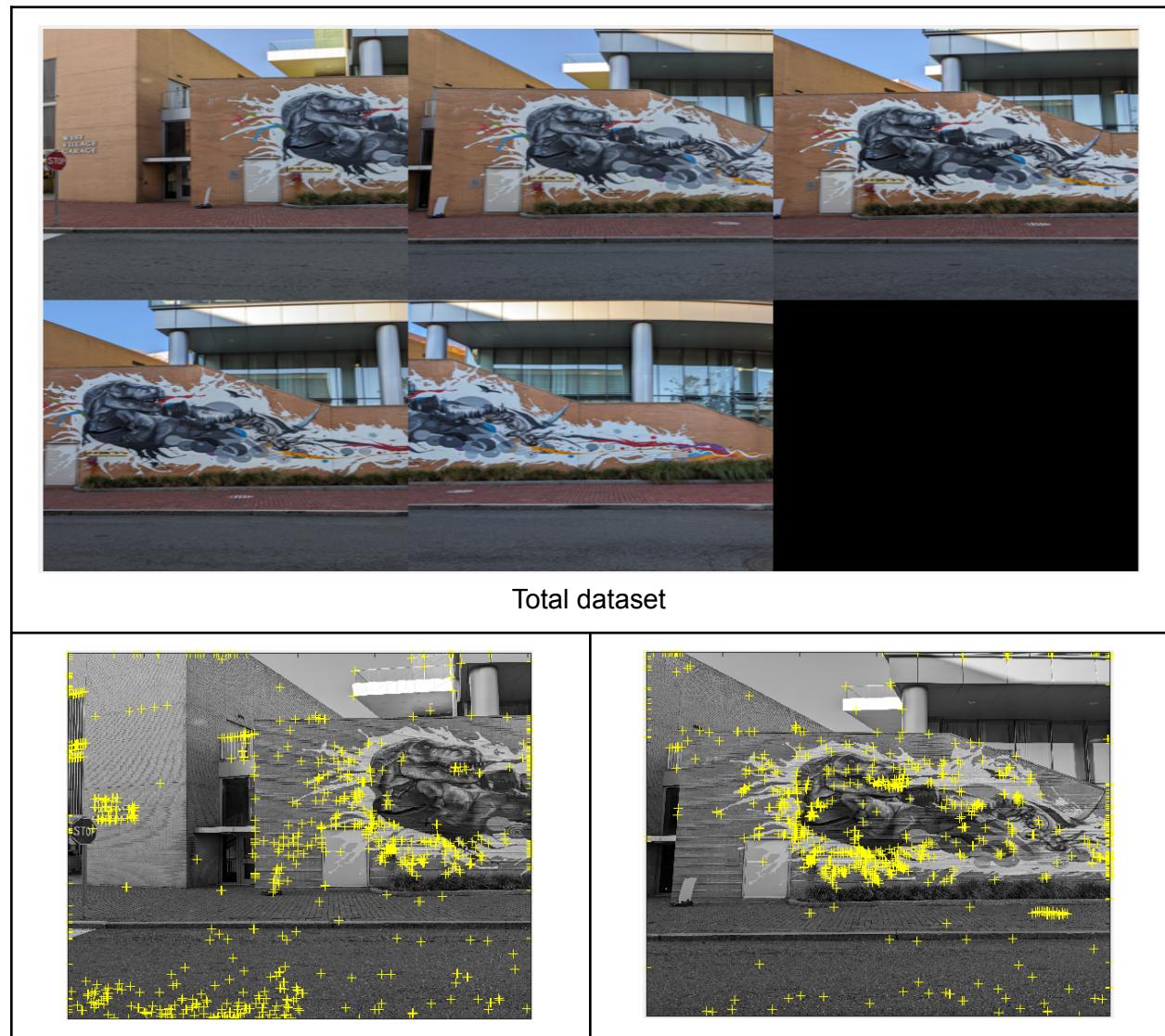


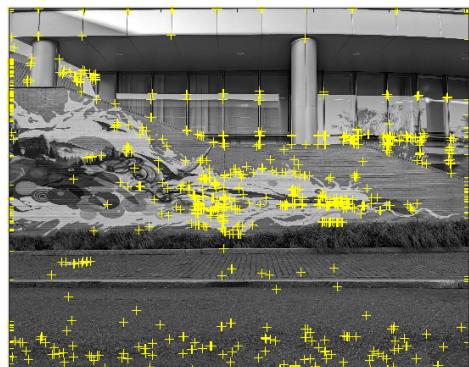
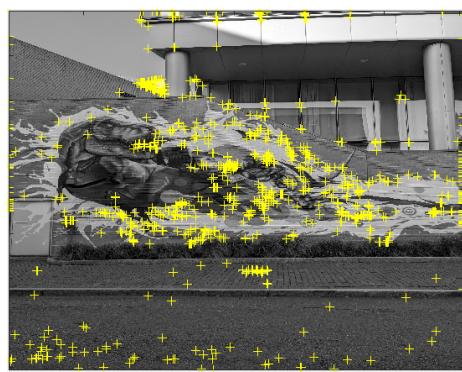
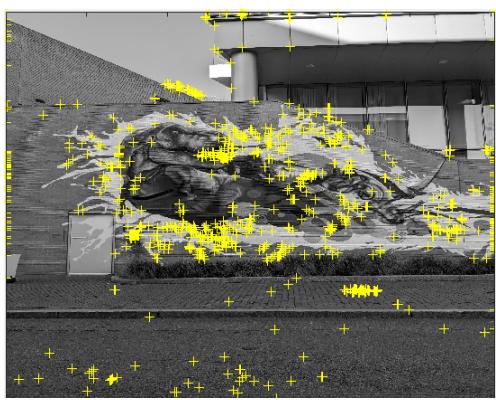
# LAB #5 Camera Mosaic

## Introduction:

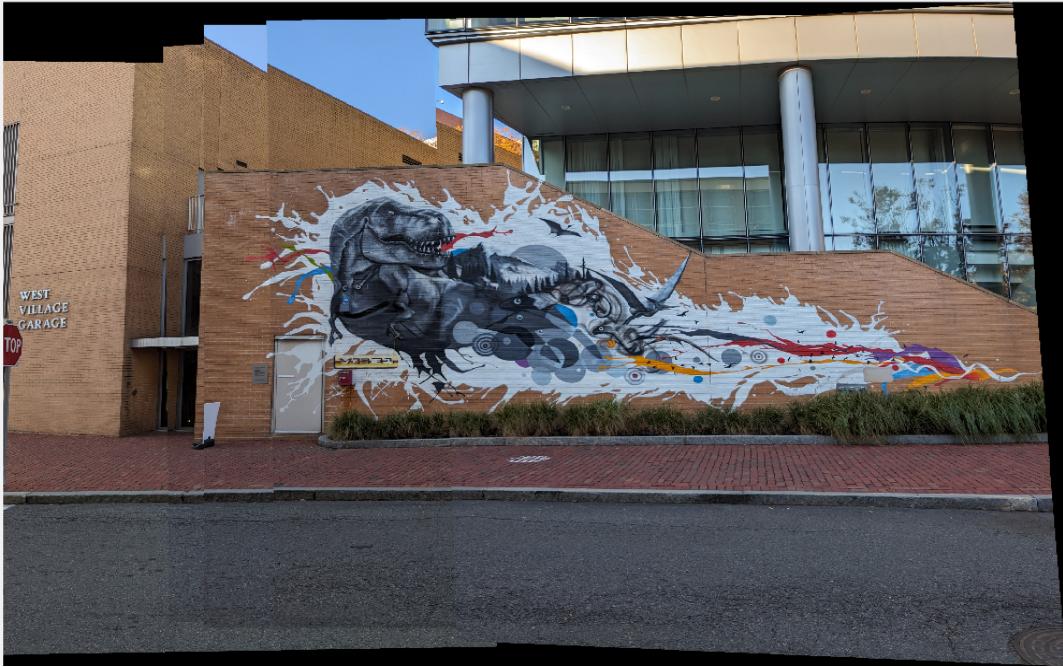
In this lab experiment, we explored panoramic image stitching by employing the Harris corner detection algorithm. Our objective was to seamlessly merge a series of individual images, taken from different points, into a single cohesive panorama. We began by implementing the Harris corner detection technique to identify distinctive feature points within the images, which served as anchor points for alignment. Subsequently, we employed geometric transformations to register and rectify the images' positions, ensuring a smooth and visually coherent panorama. The utilization of the Harris corner detection algorithm demonstrated its efficacy in pinpointing key features for image alignment, ultimately leading to the successful creation of panoramic compositions that encompassed a wider field of view.

## T-Rex Mosaic:



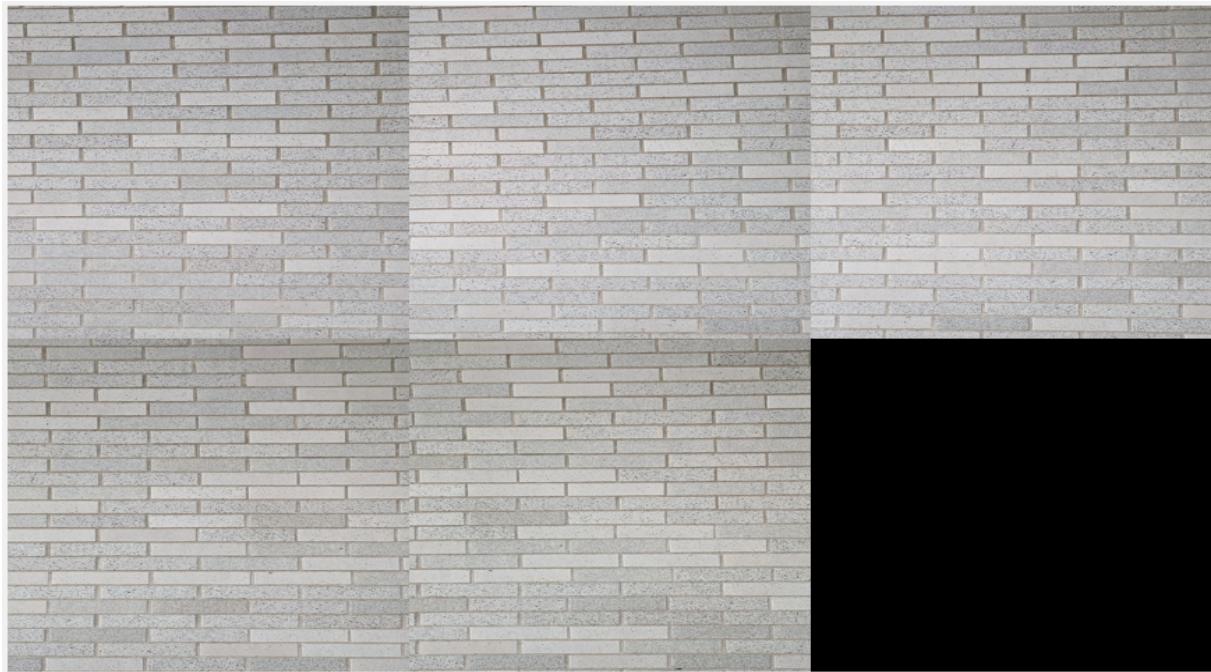


Harris Corner detector on each image



Final Image after image stitching

## Cinder Block:



Total dataset



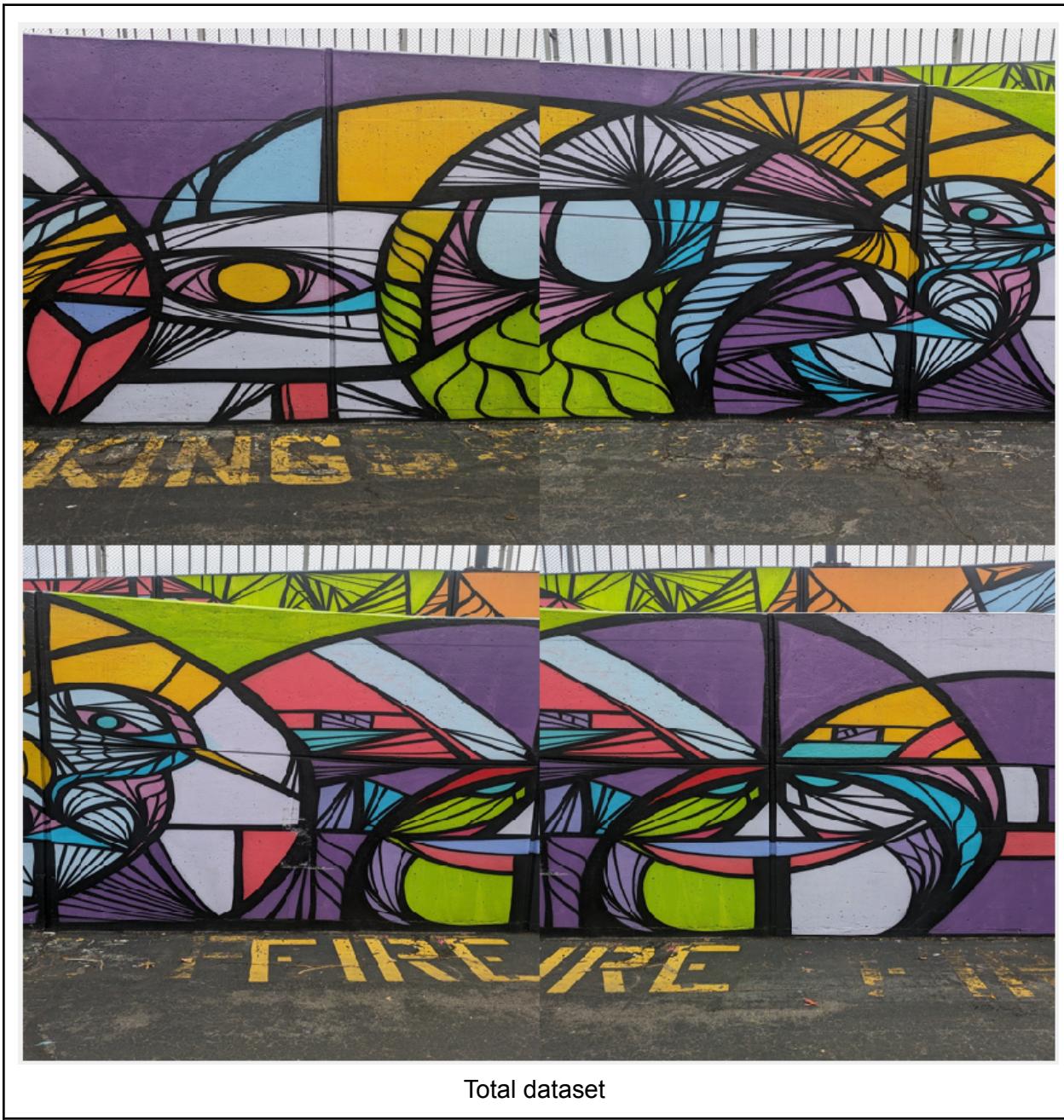


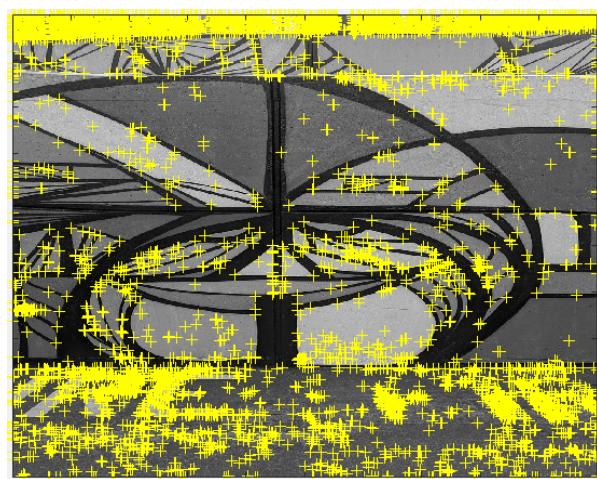
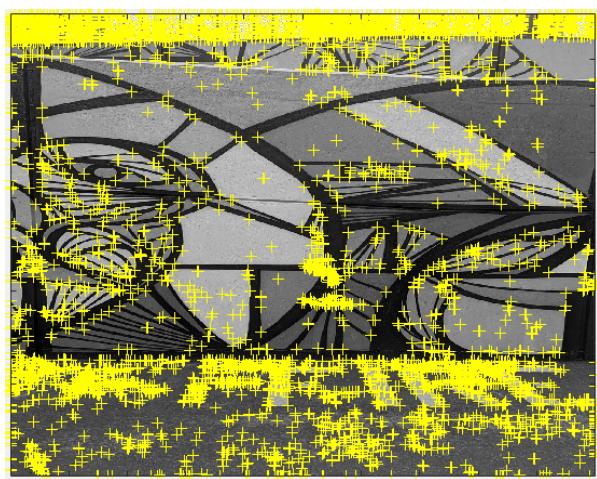
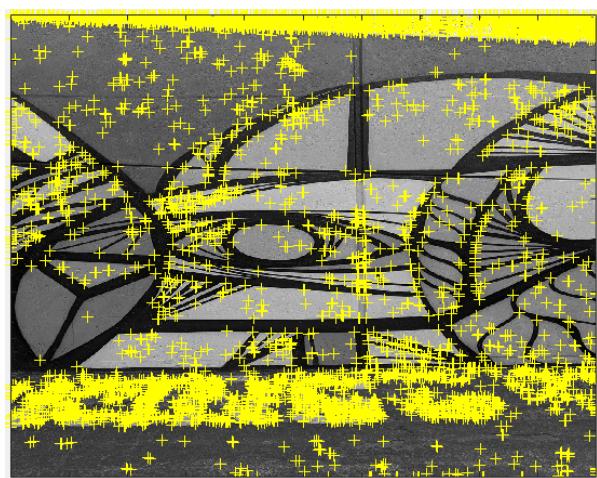
Harris corner detector on Image



Final Image after image stitching

Mosaic with 15% overlap:





Harris Corner detector on each image

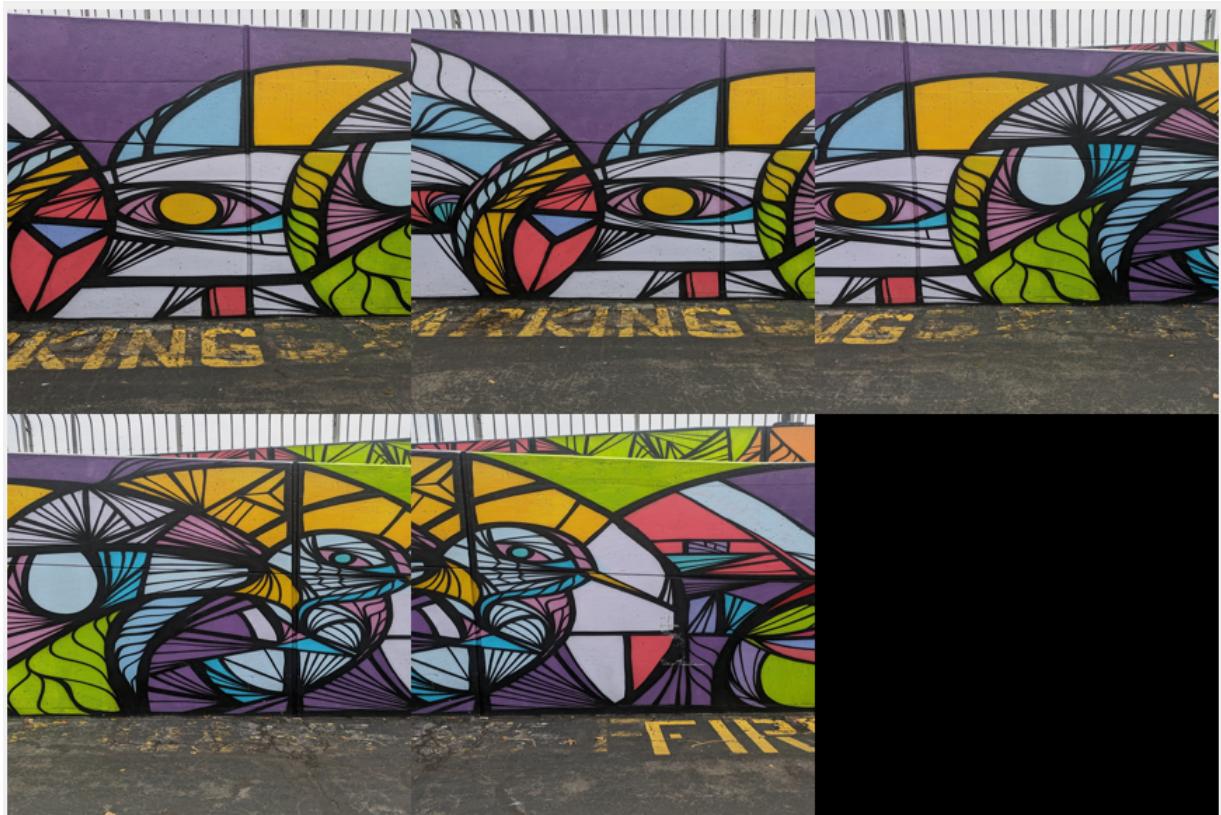


Final image on initial code with 1000 corner

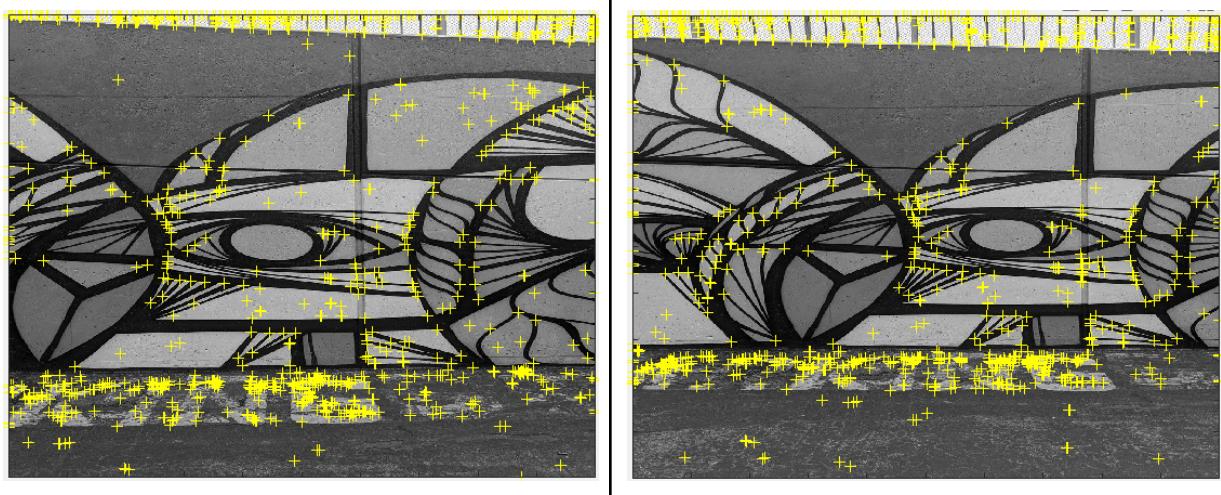


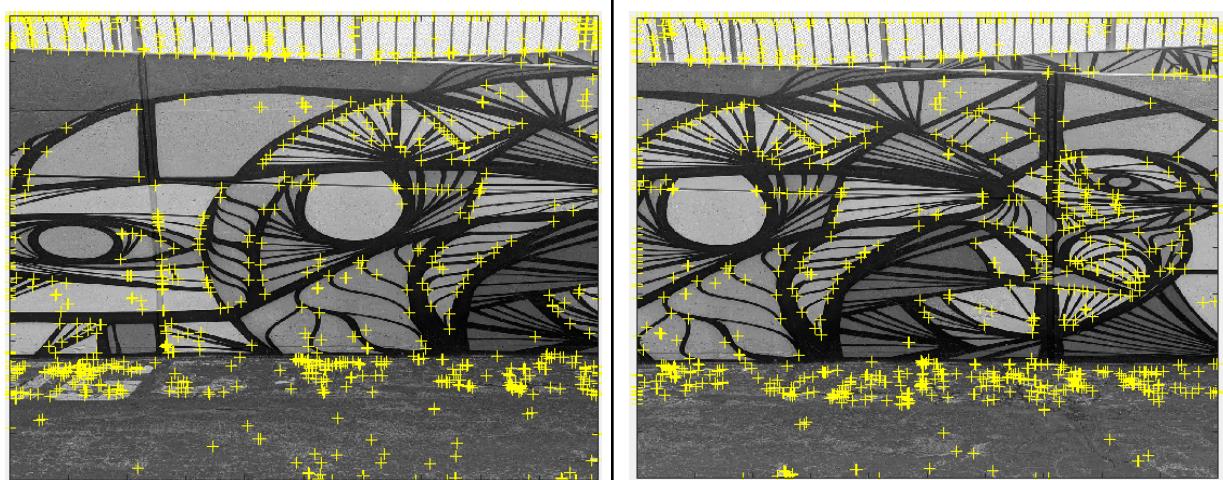
Final Image after editing code with 5000 corner

Mosaic with 50% overlap:

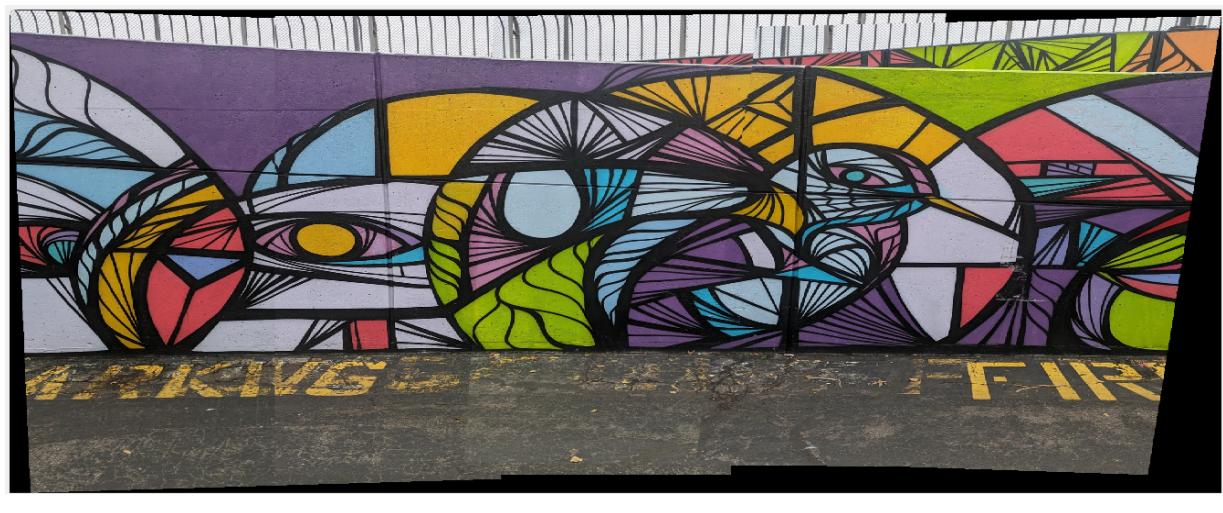


Total dataset





Harris Corner detector on each image



## Discussion/Conclusion:

### T-rex:

As per the instruction in the lab the instead of using the surface feature detector, the harris corner detector was used. We can observe in the T-Rex image that even though the T-Rex itself is complete but there are some building corners that are cut, this is because we are considering a 3d object in a 2d plane . An initial of 1000 corner points were enough to detect matches in the data set.

### Cinder Block:

Since there were many distinctive features of the cinder block the harris corner detector was able to detect the corner in the images and the algorithm was able to stitch the image as a panorama, were the block very symmetrical with no feature to match, the algorithm would not work. To verify this, a dry wall with no feature was collected as a dataset and run on the same algorithm and it showed error, since there were no similar features to match.

### Mosaic:

The Third mosaic was taken with two variations of 15% and 50% overlap. We were able to observe that the data with 50% overlap was able to run with the initial code, to detect 1000 corner points, but in the 15% overlap image we were able to observe that the algorithm was not able to stitch the image and the output of the image is also shown above, but editing the code with 5000 corner to detect we were able to stitch the image with much precision.

So in conclusion, limited feature diversity may impact the accuracy of feature detection and matching.