For the Lab5 experiment data was collected using an iPhone15 camera on multiple locations around campus, all photographs were taken under similar conditions.

LSC mosaic:

The Figure below shows the original dataset of images used for image stitching. The Harris Corner Detector Algorithm is being utilized in a lab segment to estimate points of interest, specifically corners, in each image. These corners are used to locate and estimate transformations of features around them in two images. The Maximum points and Window size input arguments of the Harris Detector are adjusted to ensure that points of interest are evenly distributed throughout the image. This tuning results in improved performance in generating panoramas, as demonstrated in the accompanying picture. Additionally, the detected points of interest in the images are shown in the figure.

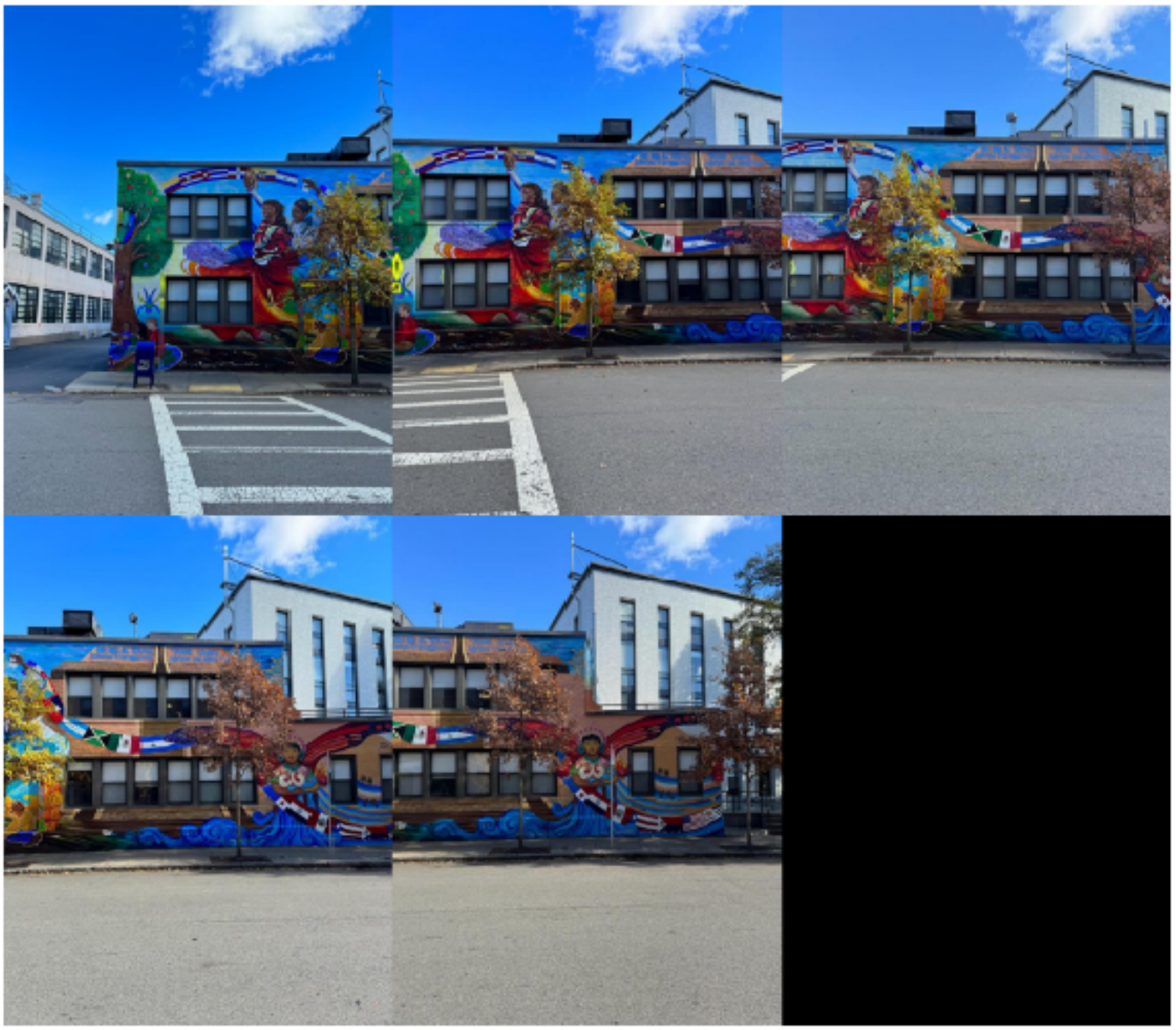

Figure_1: Montage of Latino Student Centre

It can be seen from the panorama image (Figure_3) that the image formed is good, with a little distortion in the leftmost part of the image and was created by using 1000 feature points detected using the Harris corner detection algorithm. The resulting mosaic closely resembles the original scene.

Harris points: 1000 Window size : 2x2

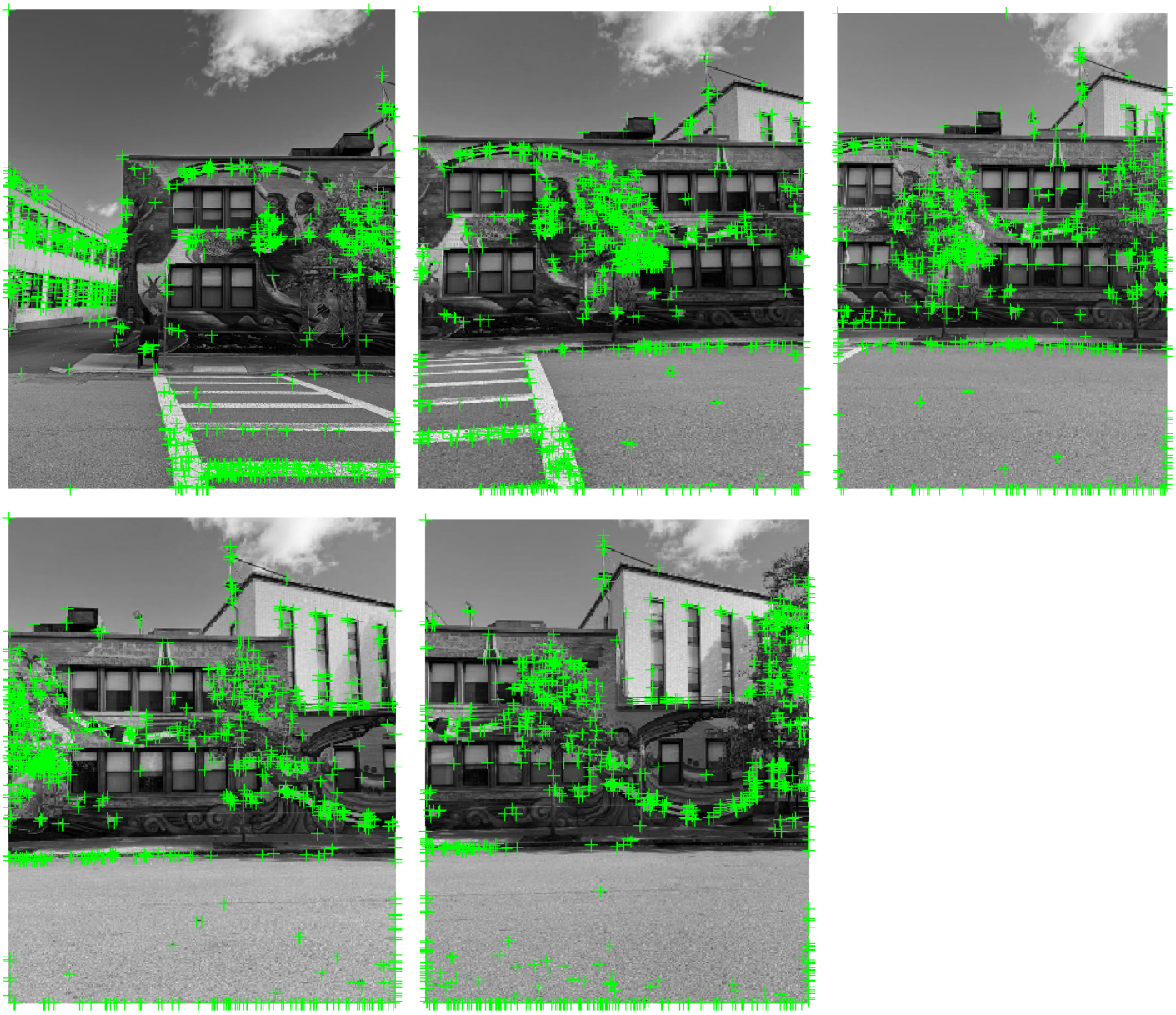

Figure_2: Harris Corner Detection

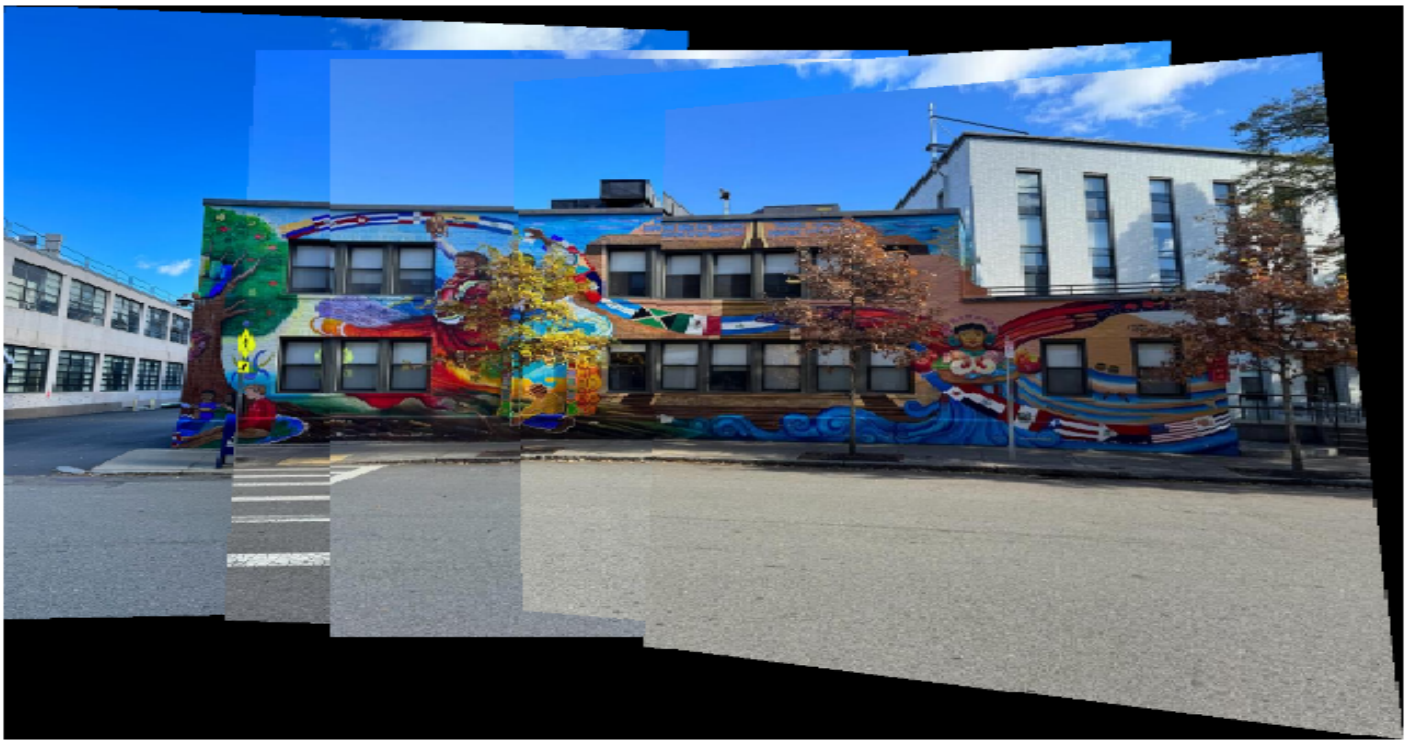

Figure_3: Panorama of Latino Student Centre

Mosaic block/brick wall :

Generally, when dealing with a dataset of brick walls, it was observed that a significant number of iterations were necessary to create a panorama. In comparison to the LSC mural dataset, a higher number of Harris corners is needed to estimate the transformation matrices for the brick or Cinder wall dataset.

Surprisingly, the same number of Harris points, that is, 1000, did the job very well, and in comparison to the LSC dataset, the brick wall looks better.

Furthermore, the confidence level for estimating the transformation was perhaps affected by the few features other than just the brick wall. Had it been only the wall, the final image would not have formed as perfectly as it should because of not having any distinct features.

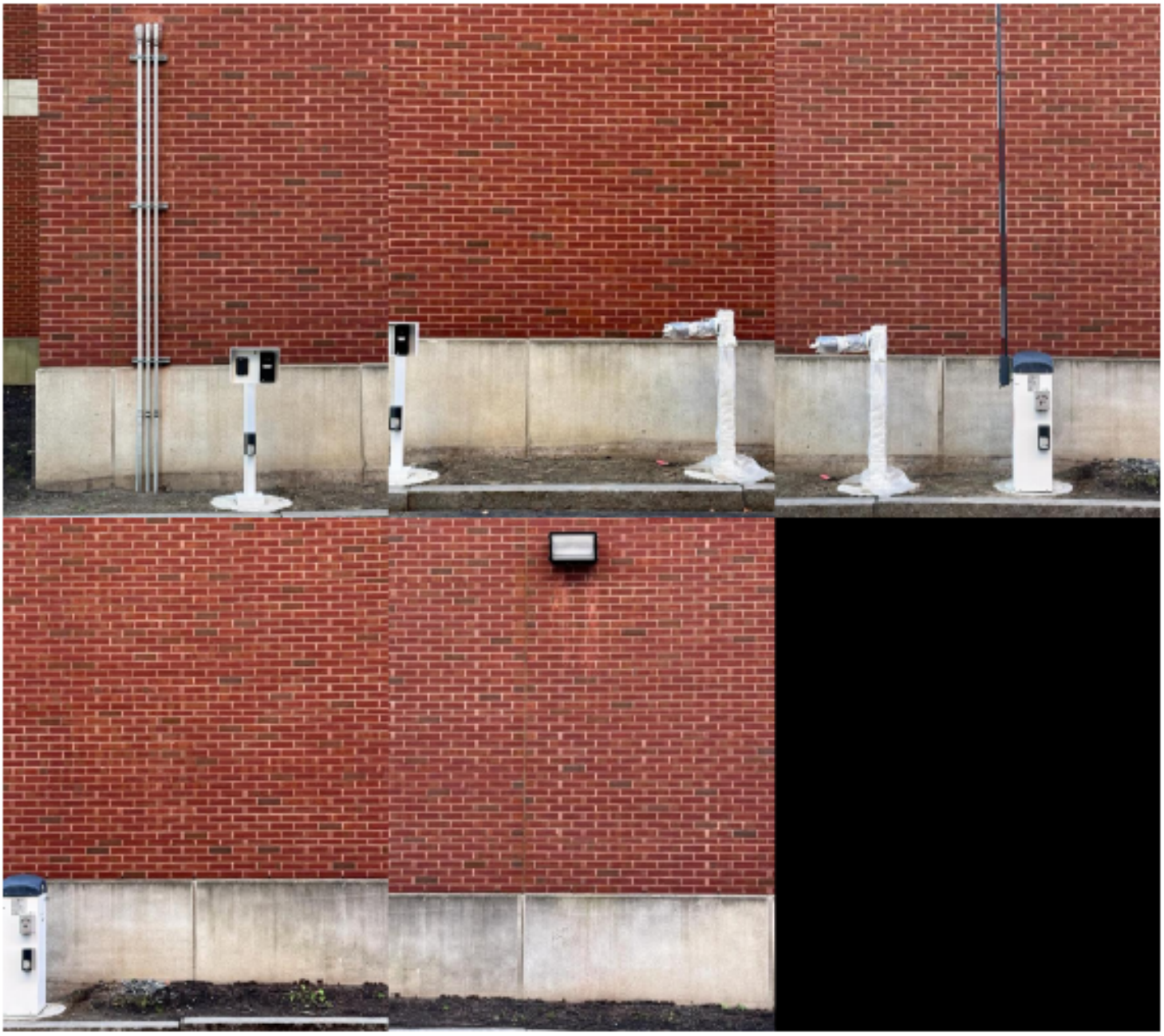

Figure_4: Montage of Brick Wall

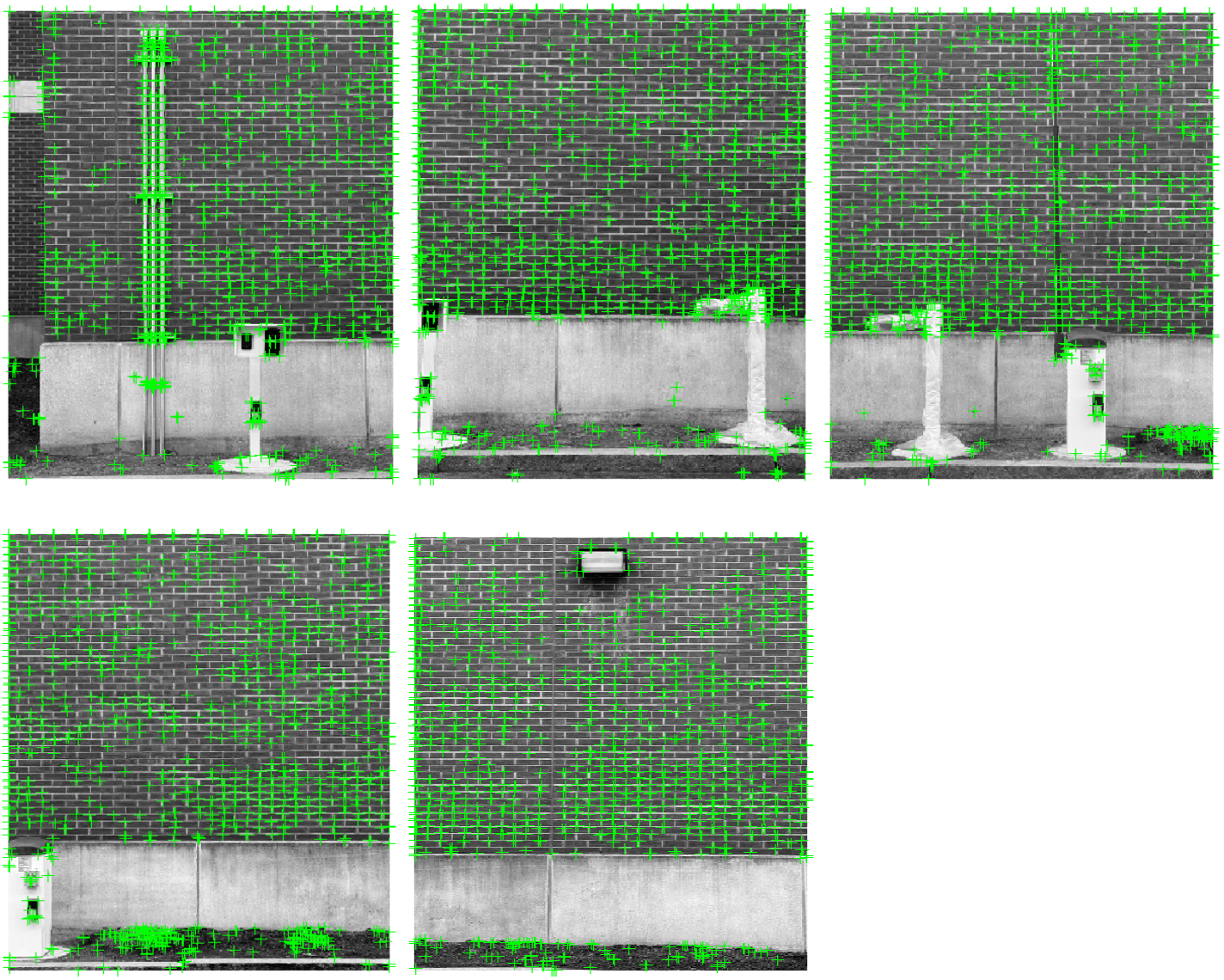

Figure_5: Harris Corner Detection

Figure_6: Panorama of Brick Wall

Mosaic with 15% overlap:

To stitch together the mural images, a dataset with 15% overlapping was utilized. Harris corner detection was applied with the same, that is 1000 corners detected for a window size of [2 2]. This was done to ensure a sufficient number of corners were detected in the left and rightmost regions of the image where overlapping between consecutive images was limited.

Figure_7: Montage of mosaic for 15% overlap

From the final figure below it can be seen that the panorama formed is very good for pictures taken with only 15% overlap (+/- 10%). The Harris Corners detected also looked good where there were more corners detected on the wall instead of the mosaic in the right and left most images.

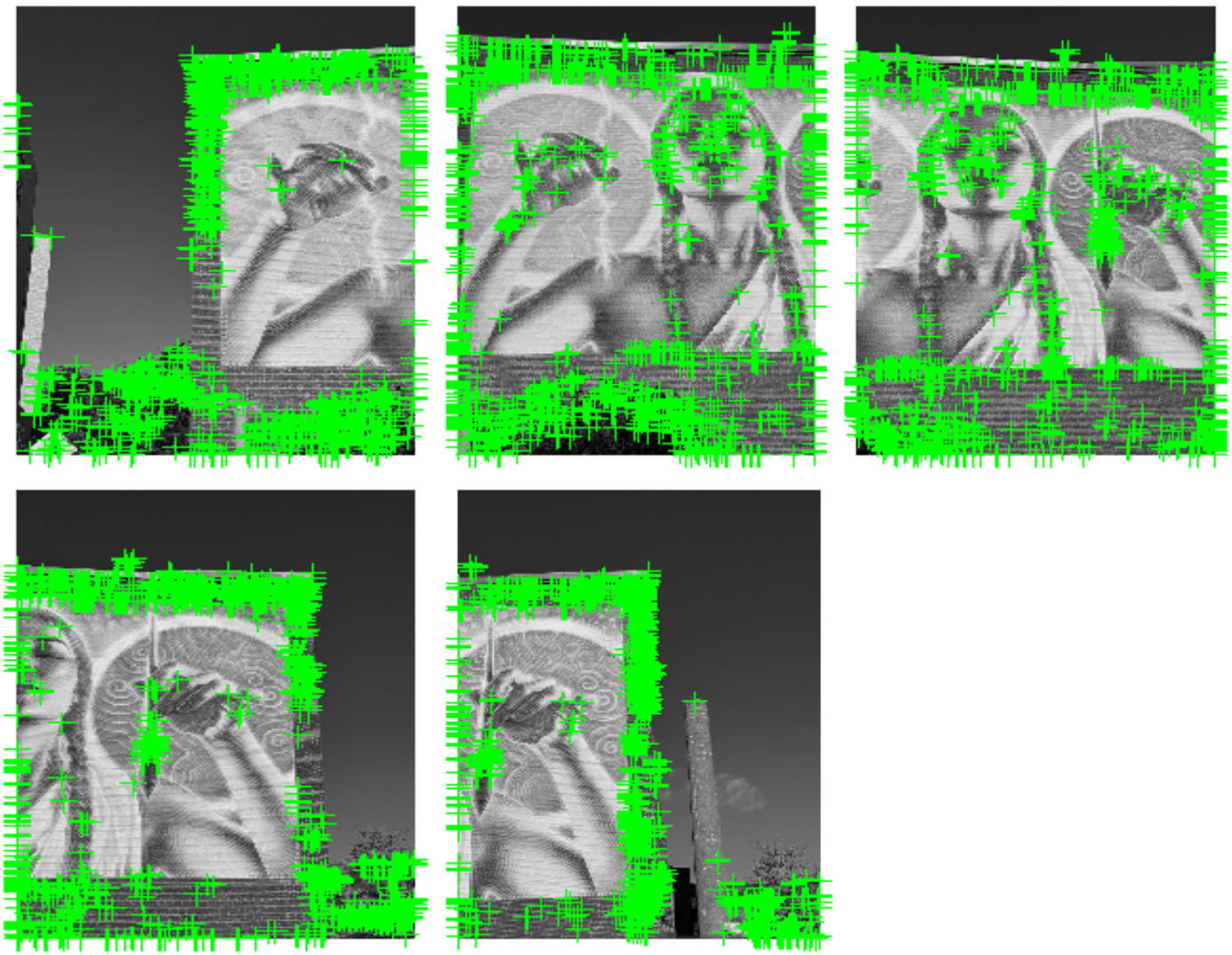

Figure_8: Harris Corner Detection

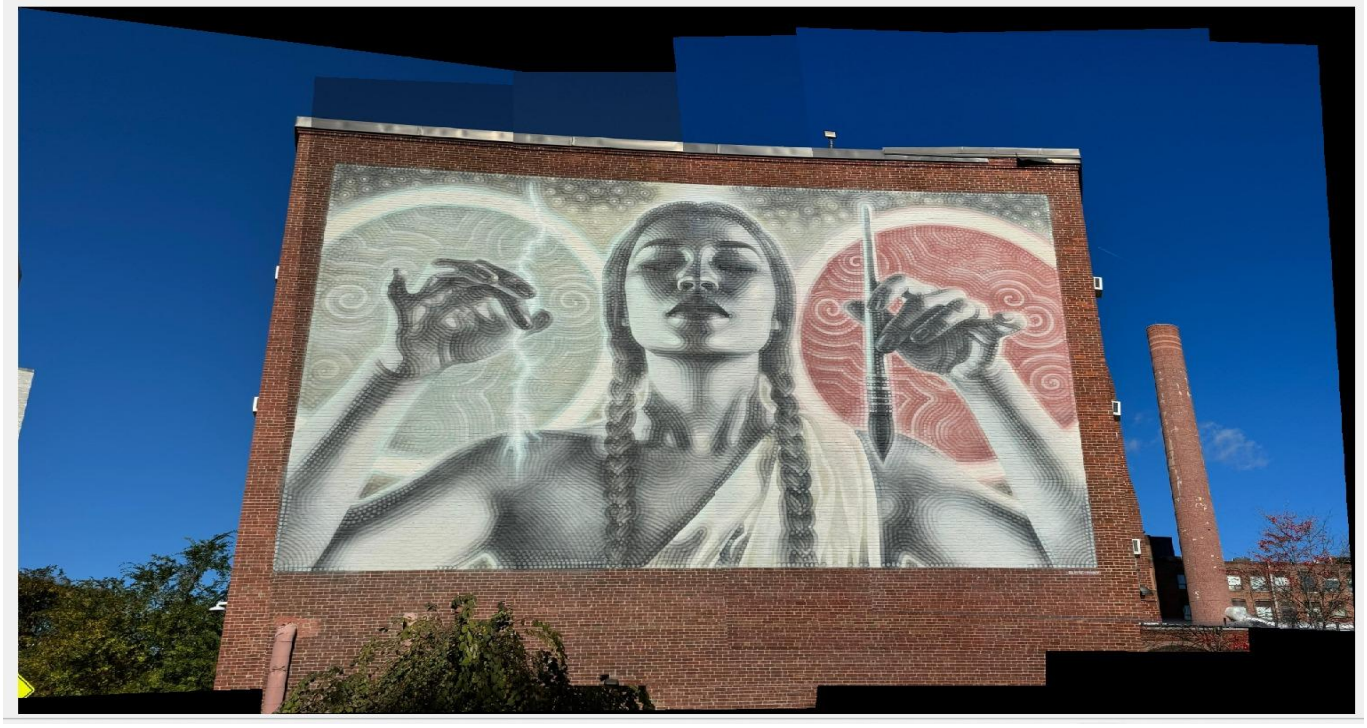

Figure_9: Panorama of Mosaic with 15% overlap

Mosaic with 50% overlap:

For comparison the same mosaic with 50% overlap is considered this time and results obtained were very much similar to the one obtained above

Figure_10:Montage of mosaic for 50% overlap

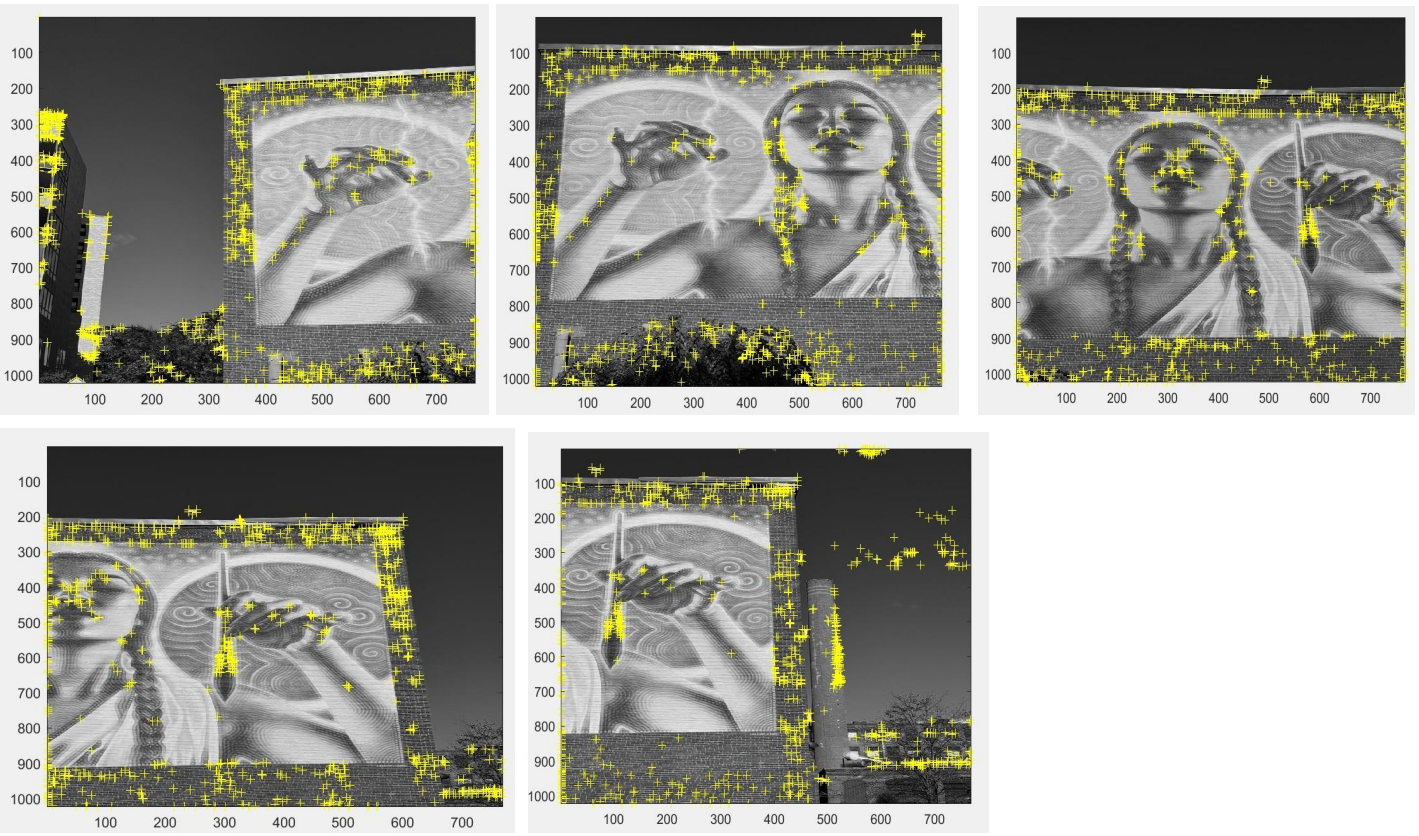

Figure_11: Harris Corner Detection

Figure_12: Panorama of Mosaic with 50% overlap