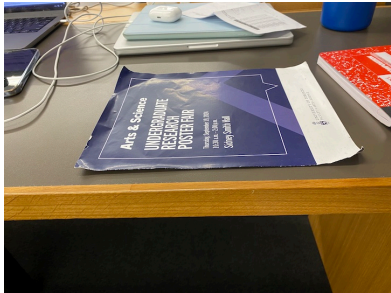CSC320 A1 Report

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Image	Input	Result
flyer0		
flyer1		
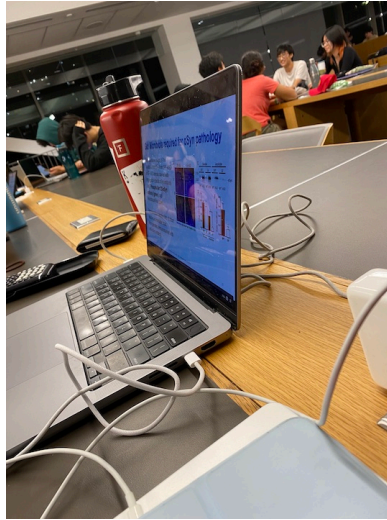
laptop		
notebook		
paper		

Artifacts and Their Causes

Image Distortion: In some of the output images, there seems to be distortions or warping on the edges of the document/item in the image. This could be because the homography matrix has some inaccuracies. If th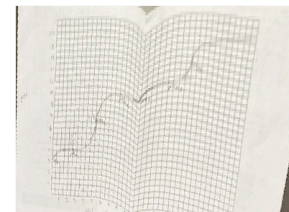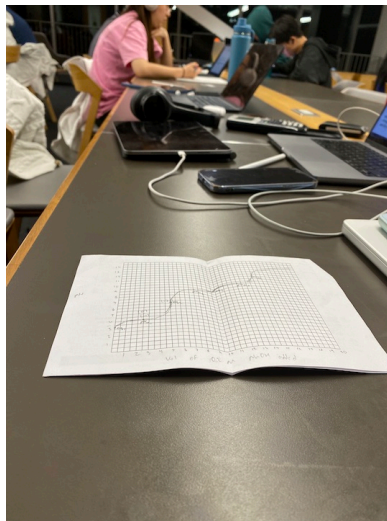e source or destination points are not perfectly aligned, it could've led to a perspective that doesn't properly represent the actual shape of the object. When I was picking the destination coordinates, I didn't keep the edges very aligned which could have caused the distortion.

Blurriness: There are some regions in the output image that appear blurry or stretched. This could be caused by the interpolation method, or lack of it, used during backward mapping, where certain pixel values are estimated to fill gaps, resulting in less sharp regions compared to the original image. Instead of interpolation, I made a decimal an integer to map, which could've been an inadequate method to have used.

Jagged Edges: The edges of the document/item in the output may look jagged or pixelated. This could be due to rounding errors when calculating the inverse homography, or poor resolution of the destination image.

Main Limitations of the Algorithm

Dependence on Good Point Selection: The algorithm depends a lot on the accuracy of the chosen source and destination coordinates. Errors in picking these coordinates could cause incorrect transformations and artifacts noticeable in the output images.

Interpolation Artifacts: To do backward mapping, interpolation is required to estimate pixel values. This can lead to artifacts like blurriness or a loss of detail. This makes the output sensitive to the type of interpolation used and can mess up the quality, particularly around areas that have text or fine details.

Better on Planar Surfaces: The algorithm works better when the input image represents a planar surface, which limits how effective it is on curved or three-dimensional objects. For example, if the document is bent or not entirely flat, the homography transformation might not be able to produce an accurate, undistorted output.