CV Assignment-2

Part-A

Canny Edge Detection

A large building with many windows

Description automatically generated with low confidence A picture containing text, dark, night sky

Description automatically generated

Original Image Canny edge detected Image

Text

Description automatically generated

Custom Gaussian Kernel with 5\*5 filter

Text, letter

Description automatically generated

Custom build Sobel\_filters

Using these custom functions, we can manipulate our image and do a non-max suppression then select only pixels that meets a weak and strong threshold value range. Also magnitudes and directions are taken and multiplied along the direction to get an edge. This is how we can get edges using canny edge detection algorithm.

Harris Corner Detection

A large building with many windows

Description automatically generated with low confidenceA picture containing text, outdoor

Description automatically generated

Original Image Harris Corner Detection

Table

Description automatically generated

Part-B

MATLAB Internal Canny edge detector

A large building with many windows

Description automatically generated with low confidence A picture containing text, night sky

Description automatically generated

Original Image Canny edge detected Image

Text

Description automatically generated

MATLAB Internal Canny edge detector

A picture containing text, outdoor

Description automatically generatedA picture containing text, LEGO, toy

Description automatically generated

As we can see the corners are shown as dots and stars MATLAB Harris corner detection works on how many corners you want. So, if I give 200 corners, it only see first 200 corners. In the above image I took around 2000 corners as my threshold value.

Image Stitching in MATLAB

A collage of buildings

Description automatically generated with low confidence

3 images that we took to stitch together

A picture containing text, outdoor, sky, building

Description automatically generated

After the images are stitched and by the way it is T-deck 😉

Function that can calculate integral image in real time

Text

Description automatically generated

Background pattern

Description automatically generated

Integral Image of live feed of the rgb camera….

A picture containing building, outdoor, city, government building

Description automatically generated

Stitched Image

A large building with a tree in front of it

Description automatically generated with low confidenceA picture containing outdoor, building, road, sky

Description automatically generatedA picture containing outdoor, building, road, sky

Description automatically generated

Parts of images to be stitched

A picture containing text

Description automatically generated

Class to calculate panorama in realtime.

A picture containing text, outdoor, grass

Description automatically generated

Sift Feature matching before creating a panorama. The feature selecting is done by SSD which is sum of squared distances.