**TUGAS 5 - Resume**

**MK Pengolahan Citra Digital**

**Dosen Pengampu : Dr. Hadi Nasbey, S.Pd., M.Si**

Nama Mahasiswa : Difa Farhani Hakim

NIM : 1306620040

Kelas : Fisika B 2020

Resume Video

A close-up of a person's face

Description automatically generated with low confidenceDigital Image Filtering

Zoom in image became pixaleted. Using convolution to apply filter or kernel to make new output of the picture. Convolution is multiplacation of a kernel from the image.

Padding

Are for so the convolution method working properly by insert a new pixel around the exterior of the picture to make the output still same as the original image. It can be all 0 in the padding or the same number as the neighbouring pixel.

Data type for image processing:

uint8 = 0 – 255

uint16 = 0 – 65535

To compute a image we can use the float data type so there is no rounding error and it can normalize from 0 – 1.

Source code:

from skimage import io, img\_as\_float

import numpy as np

import cv2

from scipy.signal import convolve2d

img =- img\_as\_float(io.imread(‘image.jpg’, as\_gray = True))

kernel = np.ones((5,5), np.float32)/25

gaussian\_kernel = np.array([1/16,1/8,1/16], [1/8,1/4,1/8], [1/16, 1/8, 1/16]])

conv\_using\_cv2 = cv2.filter2D(img, -1, gaussian\_kernel, broderType=cv2.BORDER\_CONSTANT)

cv2.imshow(‘original’,img)

cv2.imshow(‘cv filter’, conv\_using\_cv2)

cv2.waitKey(0)

cv2.destroyAllWindows()

How Convolution Works with Julia

Blur a low bit resolution image, it can be use with a average kernel of 1/9 each pixel. There is a edge case and in this function the outside image are consider a black pixel so it became darker in the edges. A typical convention of a edge case is a neighbouring pixel for the outside pixel.

Other kernel of 5x5 can be used a weighted so it added up by 1 or it called a gaussian bell curve. The center affect more into the output than the side or corner.

sum kernel of 1 it can be used to make the original color still be able to comes up in the output. And not affected by the neighbouring pixel so much.

How Blurs & Filters Work

Kernel Convolution are the core of image filtering. Is a method to transform an image into a new pixel output. Kernel of mean (average) filter are 1 on a each row. For edge cases can be considered a neighbouring pixel or make it 0 so it doesn’t contribute to anything in the process.

This are a low level filtering that aren’t used in a camera phone or social media application. They used combination of low level filtering to make other kind of filters.

Smoothing Process

9x9 sample image are smoothed out by 3x3 neighbourhood into a output canvas image. It move by a rastering so it move from the left to right. The result is a simple smooth graph and doesn’t have a dot of black pixel or white pixel that are contrast to other.