**교육일지**

**교육 제목 : 비전**

**교육 장소 : YGL C6 강의실**

**교육 일시 : 2021/11/05**

**영상속성**

**# cv2.imread(filename[, flags]) -> retval**

**# retval**

**# numpy.nbarray: retval.ndim/shape/size/dtype**

**# dtype: uint8**

**# shape: gray영상의 경우 (h,w) 또는 color (h,w, 3)**

**# gray영상 : cv2.CV\_8UC1 -> numpy.uint8**

**# color영상 : cv2.CV\_8UC3 -> numpy.uint8**

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**영상의 크기 참조**

**h, w = img1.shape**

**print('img1 size: {} x {}'.format(w, h))**

**h, w = imgh, w = img1.shape**

**print('img1 size: {} x {}'.format(w, h))**

**h, w = img2.shape[:2]**

**print('img2 size: {} x {}'.format(w, h))2.shape[:2]**

**print('img2 size: {} x {}'.format(w, h))**

**영상의 픽셀값 참조**

**x = 20**

**y = 30**

**p1 =img1[y,x]**

**print(p1)**

**p2 = img2[y, x]**

**print(p2)**

**### 픽셀값 바꾸기**

**img1[10:20, 10:20] = 0**

**img2[10:20, 10:20] = (0, 0, 255)**

**cv2.imshow('image', img1)**

**cv2.imshow('image2',img2)**

**cv2.waitKey()**

**cv2.destroyAllWindows()**

**영상생성**

**import numpy as np**

**import cv2**

**# 새 영상 생성하기**

**img1 = np.empty((240, 320), dtype=np.uint8) # grayscale image**

**img2 = np.zeros((240, 320, 3), dtype=np.uint8) # color image**

**img3 = np.ones((240, 320), dtype=np.uint8) \* 255 # dark gray**

**img4 = np.full((240, 320, 3), (0, 255, 255), dtype=np.uint8) # yellow**

**cv2.imshow('img1', img1)**

**cv2.imshow('img2', img2)**

**cv2.imshow('img3', img3)**

**cv2.imshow('img4', img4)**

**cv2.waitKey()**

**cv2.destroyAllWindows()**

**새영상 생성**

**# 영상 복사**

**img1 = cv2.imread('fig/puppy.bmp', cv2.IMREAD\_COLOR)**

**# img1 = cv2.imread('HappyFish.jpg')**

**if img1 is None:**

**print("image load failed")**

**sys.exit()**

**img2 = img1**

**img3 = img1.copy()**

**img1[200:300,240:400] = (0, 255, 255)**

**print(img1.shape)**

**print(img1.dtype)**

**cv2.imshow('img1', img1)**

**cv2.imshow('img2', img2)**

**cv2.imshow('img3', img3)**

**cv2.waitKey()**

**cv2.destroyAllWindows()**

**부분 영상 추출**

**img1 = cv2.imread('fig/puppy.bmp')**

**img2 = img1[200:400, 300:500] # numpy.ndarray의 슬라이싱**

**img3 = img1[200:400, 300:500].copy()**

**# img1.fill(255)**

**cv2.circle(img2, (100, 100), 50, (0, 0, 255), 3)**

**cv2.imshow('img1', img1)**

**cv2.imshow('img2', img2)**

**cv2.imshow('img3', img3)**

**cv2.waitKey()**

**cv2.destroyAllWindows()**

**마스크 연산과 ROI**

**# 마스크 영상을 이용한 영상 합성**

**# cv2.copyTo(src, mask, dst = None) -> dst**

**src = cv2.imread('fig/airplane.bmp', cv2.IMREAD\_COLOR)**

**mask = cv2.imread('fig/mask\_plane.bmp', cv2.IMREAD\_GRAYSCALE)**

**dst = cv2.imread('fig/field.bmp', cv2.IMREAD\_COLOR)**

**if src is None or mask is None or dst is None:**

**print('Image load failed!')**

**sys.exit()**

**# 영상의 포맷과 형식이 같아야 함**

**cv2.copyTo(src, mask, dst)**

**# dst = cv2.copyTo(src, mask)**

**# Using numpy**

**# dst[mask > 0] = src[mask > 0]**

**cv2.imshow('src', src)**

**cv2.imshow('dst', dst)**

**cv2.imshow('mask', mask)**

**cv2.waitKey()**

**cv2.destroyAllWindows()**