Pattern Recognition

Lab 01

Feature Representation & HOG

Chung-Ang University

Fall 2022

Color Histogram Feature

```
def get_color_histogram(x):

  hist_feature = []

  for i in range(len(x)):

    curr_img_hsv = cv2.cvtColor(x[i], cv2.COLOR_BGR2HSV)

    curr_hist = cv2.calcHist([curr_img_hsv], [0], None, [20], [0, 180])

    curr_hist = curr_hist.squeeze().astype(np.float64)

    hist_feature.append(curr_hist/np.sum(curr_hist))

  return hist_feature
```

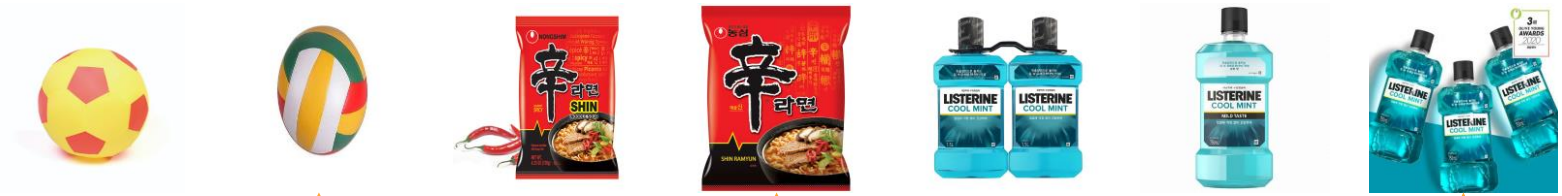
HOG Feature

```
def get_hog_feature(x):

  hog_feature = []

  for i in range(len(x)):

    curr_img_hsv = cv2.cvtColor(x[i], cv2.COLOR_BGR2HSV)

    _, curr_hog = hog(curr_img_hsv[:,:,2], orientations=9, pixels_per_cell=(8, 8),
                      cells_per_block=(2, 2), visualize=True, multichannel=False)

    curr_hog = np.reshape(curr_hog, [-1])

    hog_feature.append(curr_hog)

  return hog_feature
```

```
from skimage.feature import hog
```

Image Retrieval

Query Images

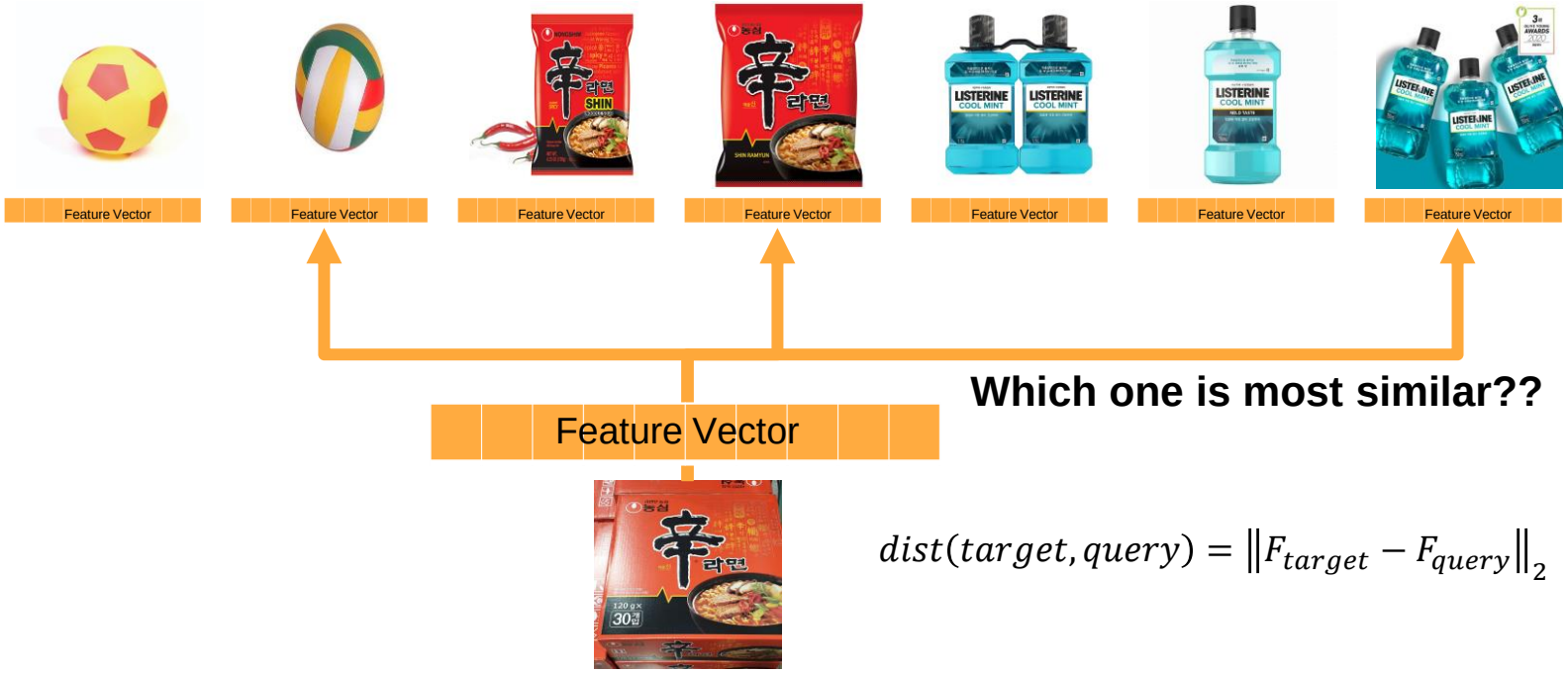


Which one is most similar??

Target Image

Image Retrieval with Handcrafted Visual Features

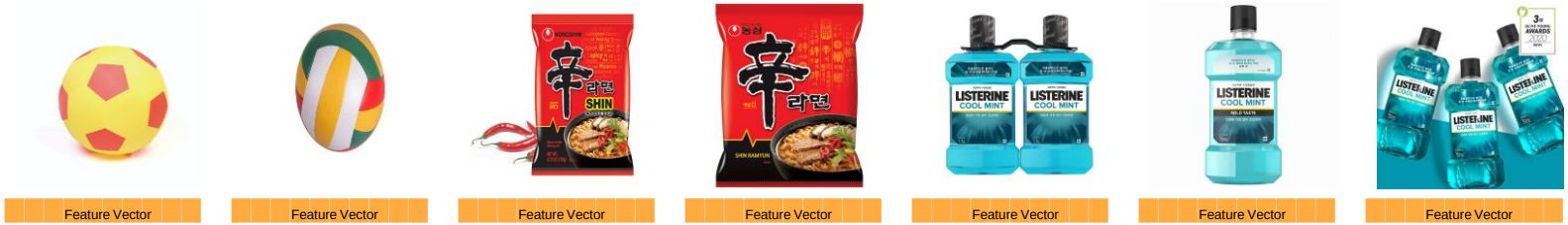
Query Images



$$dist(target, query) = \left\| F_{target} - F_{query} \right\|_2$$

Image Retrieval with Handcrafted Visual Features

Query Images



$$dist(target, query) = \left\| F_{target} - F_{query} \right\|_2$$

Target Image

Thank you