

```
In [1]: import pandas as pd
import numpy as np
from collections import Counter
from matplotlib import pyplot as plt
import os
import cv2
%matplotlib inline
```

```
In [2]: %%javascript
IPython.OutputArea.auto_scroll_threshold = 9999;
```

```
In [3]: def load_filepaths():
    imdir_ideology = 'ideology_image_dataset/'
    ideology_files=os.listdir('ideology_image_dataset/')
    ideology_files_path=[os.path.join(imdir_ideology,file) for file in ideology_files]

    return ideology_files_path

ideology_files_path=load_filepaths()
len(ideology_files_path)
```

```
Out[3]: 2942
```

```
In [4]: def showClustering(predicted_labels,label):
    label_indexs= np.where(predicted_labels==label)[0]
    print("CLUSTER--> ",label,"TOTAL IMAGES--> ",len(label_indexs))
    if(len(label_indexs)>=500):
        fig=plt.figure(figsize=(10, 400))

    elif(len(label_indexs)>100 and len(label_indexs)<500):
        fig=plt.figure(figsize=(10, 70))
    elif(len(label_indexs)>=50 and len(label_indexs)<100):
        fig=plt.figure(figsize=(10, 30))

    elif(len(label_indexs)>=20 and len(label_indexs)<50):
        fig=plt.figure(figsize=(10, 20))

    elif(len(label_indexs)>=0 and len(label_indexs)<20):
        fig=plt.figure(figsize=(10, 8))

    for i,index in enumerate(label_indexs):

        image = cv2.imread(ideology_files_path[index])
        image= cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

        columns = 4
        rows = np.ceil(len(label_indexs)/float(columns))

        fig.add_subplot(rows,columns, i+1)
        plt.imshow(image)

    plt.show()
```

```
In [7]: results_df=pd.read_csv('D://Himani-work/gsoc2020/code/image-results-hier/ideology_model_densenet121.npy-pca.csv')
results_df
```

Out[7]:

	Unnamed: 0	n_clusters	silhouette	calinski	davies
0	Birch	2681	0.122920	357.877027	0.109473
1	Agglomerative clustering	1717	0.252728	34.478473	0.604448

```
In [8]: predicted_Labels=np.load('D://Himani-work/gsoc2020/code/image-results-hier/ide  
ology_model_densenet121.npy-pca_agg_labels.npy')  
unique_labels=set(predicted_Labels)  
for label in unique_labels:  
    if(label!=-1):  
        showClustering(predicted_Labels,label)
```

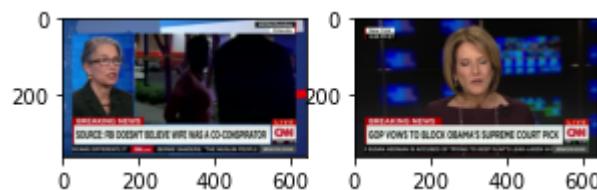
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CLUSTER--> 1 TOTAL IMAGES--> 3



CLUSTER--> 2 TOTAL IMAGES--> 2



CLUSTER--> 3 TOTAL IMAGES--> 3



CLUSTER--> 4 TOTAL IMAGES--> 3



CLUSTER--> 5 TOTAL IMAGES--> 3



CLUSTER--> 6 TOTAL IMAGES--> 5



CLUSTER--> 7 TOTAL IMAGES--> 3



CLUSTER--> 8 TOTAL IMAGES--> 2



CLUSTER--> 9 TOTAL IMAGES--> 3



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CLUSTER--> 12 TOTAL IMAGES--> 2



CLUSTER--> 13 TOTAL IMAGES--> 2



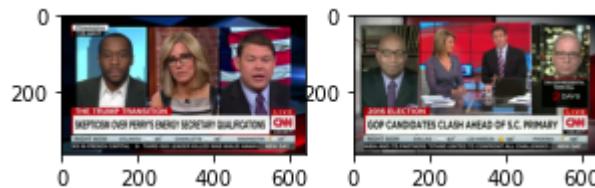
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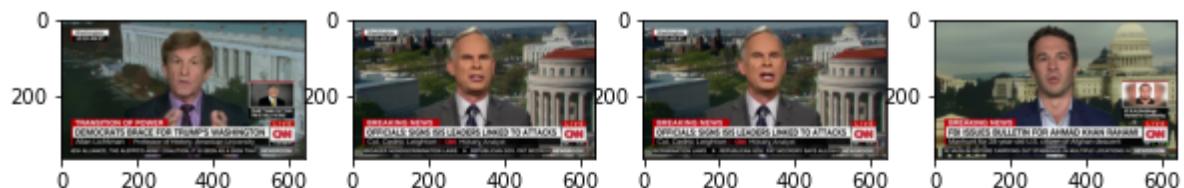
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CLUSTER--> 21 TOTAL IMAGES--> 3



CLUSTER--> 22 TOTAL IMAGES--> 3



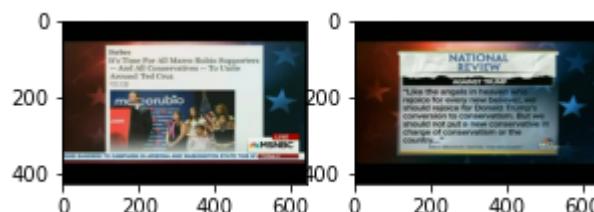
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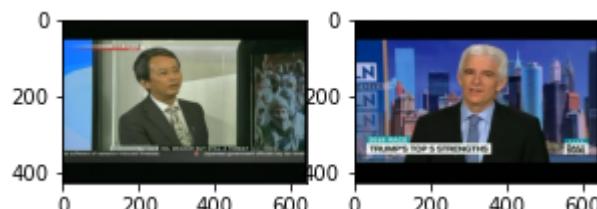
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CLUSTER--> 27 TOTAL IMAGES--> 2



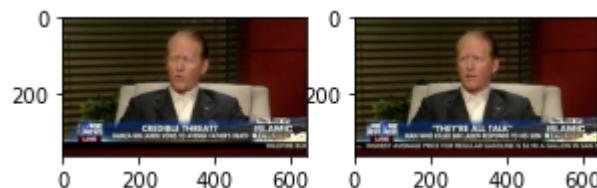
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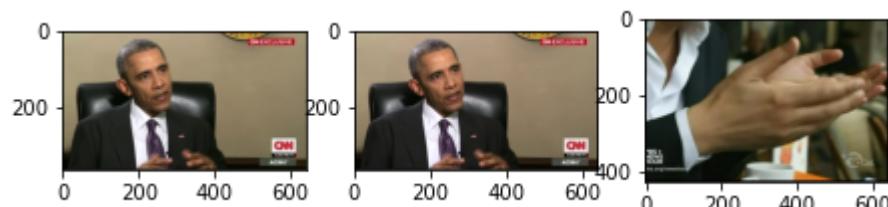
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CLUSTER--> 33 TOTAL IMAGES--> 2



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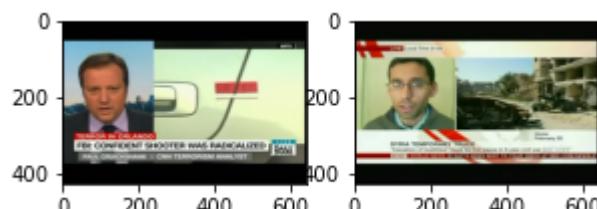
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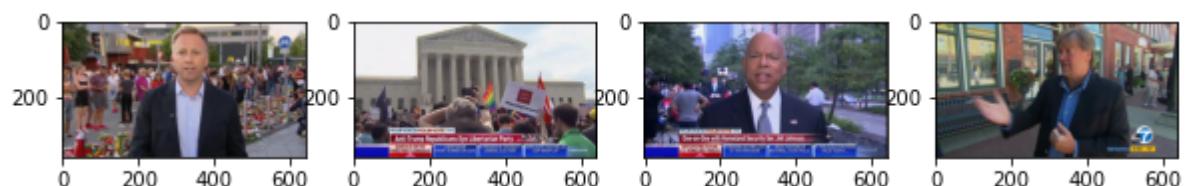
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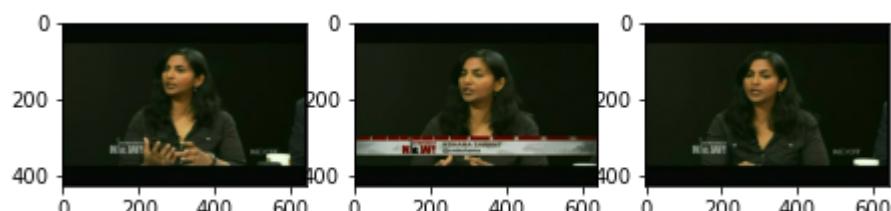
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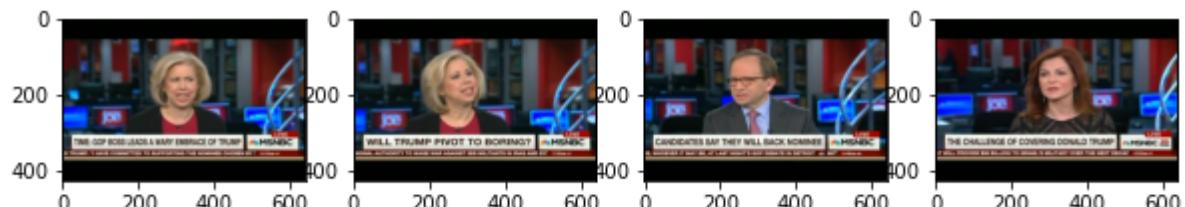
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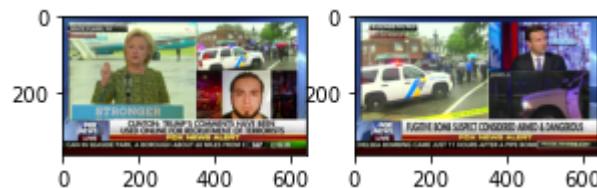
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CLUSTER--> 46 TOTAL IMAGES--> 2



CLUSTER--> 47 TOTAL IMAGES--> 3



CLUSTER--> 48 TOTAL IMAGES--> 3



CLUSTER--> 49 TOTAL IMAGES--> 3



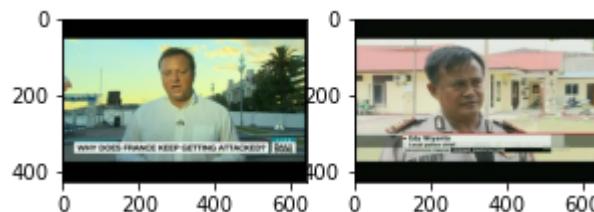
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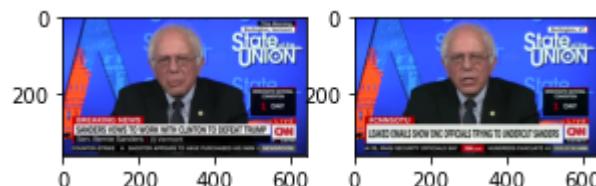
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CLUSTER--> 55 TOTAL IMAGES--> 2



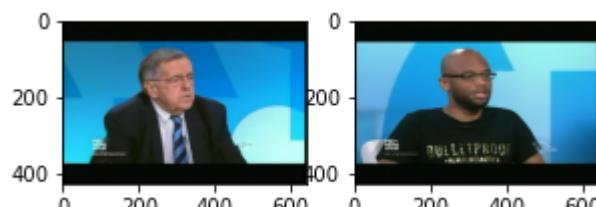
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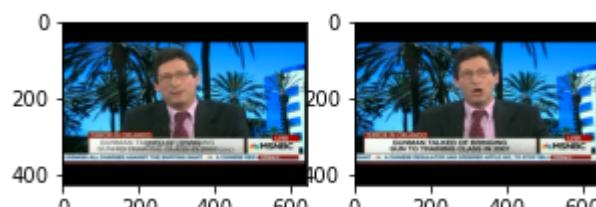
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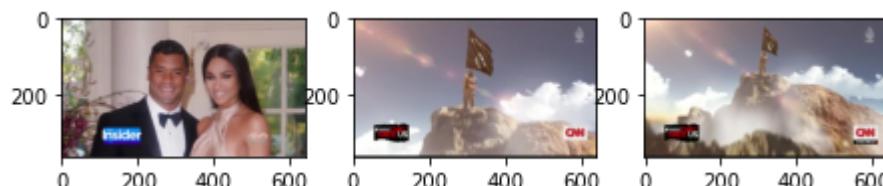
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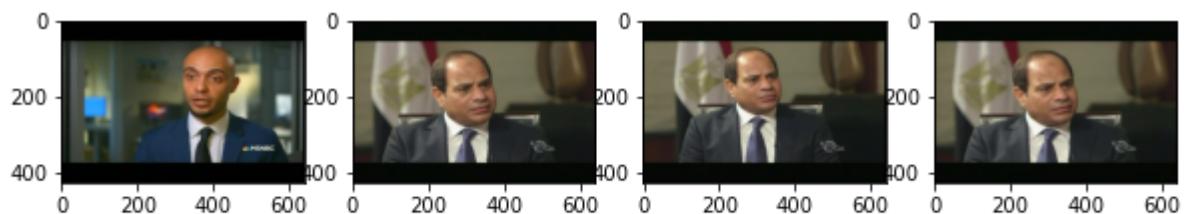
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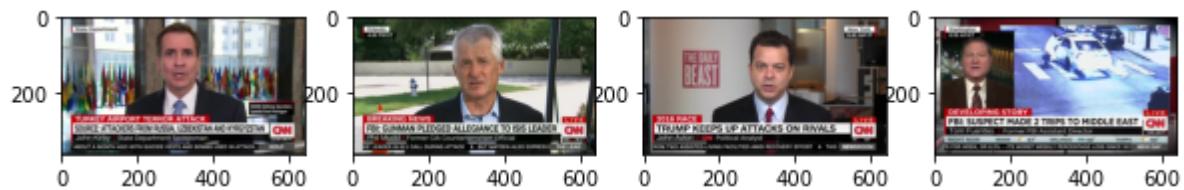
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CLUSTER--> 63 TOTAL IMAGES--> 5



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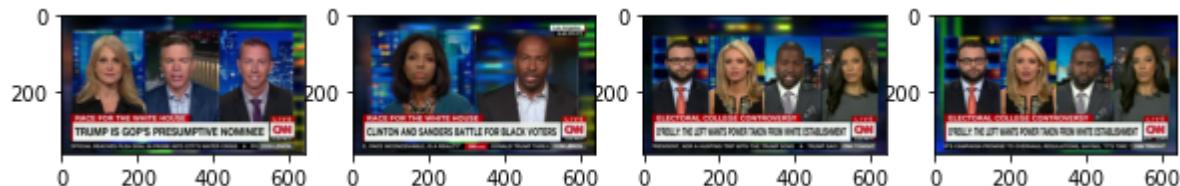
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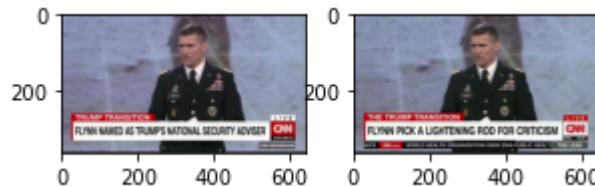
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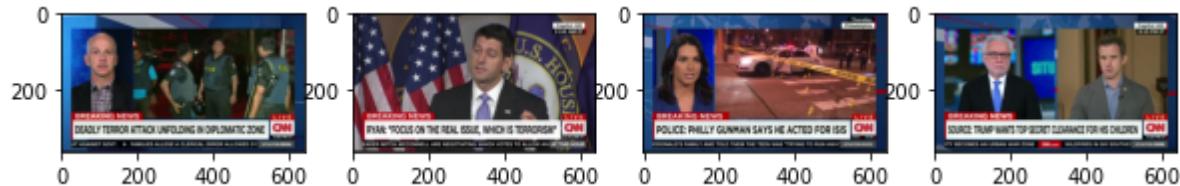
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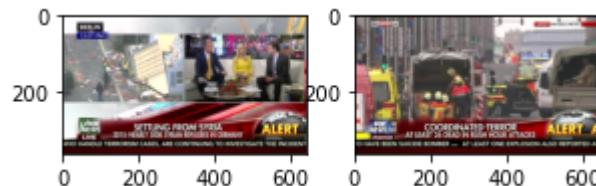
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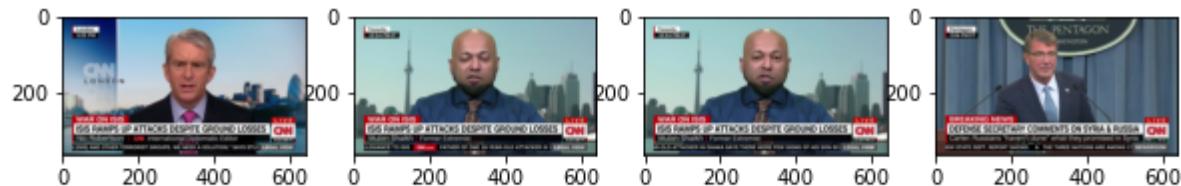
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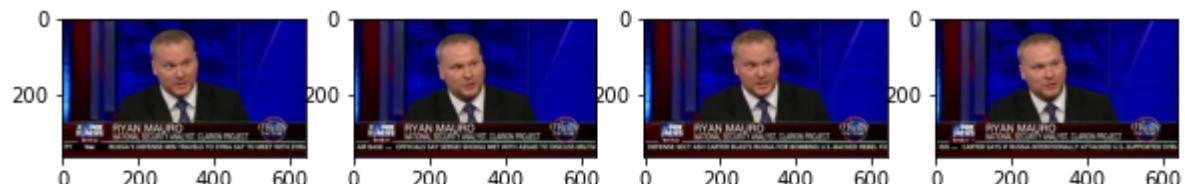
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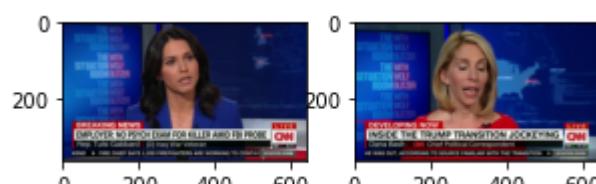
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CLUSTER--> 82 TOTAL IMAGES--> 2



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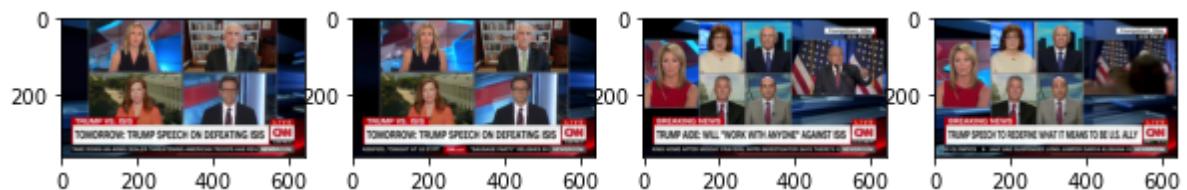
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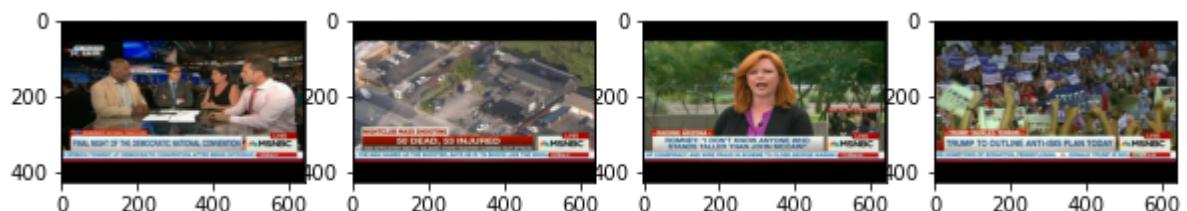
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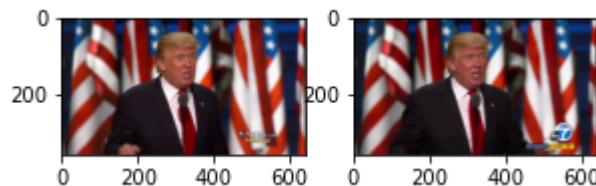
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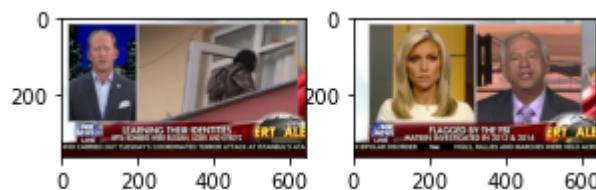
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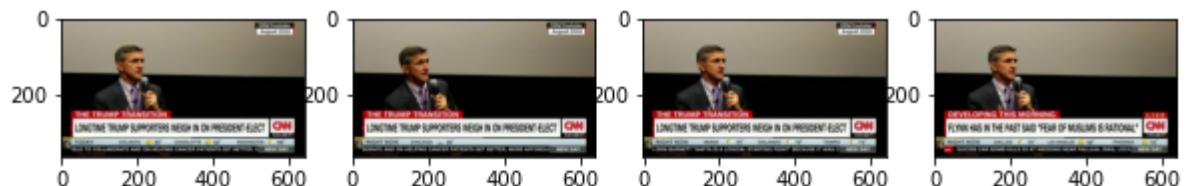
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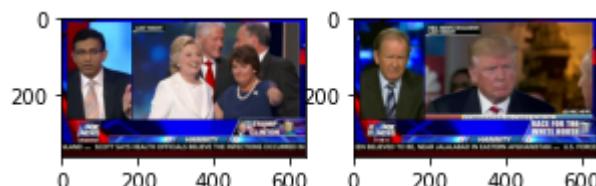
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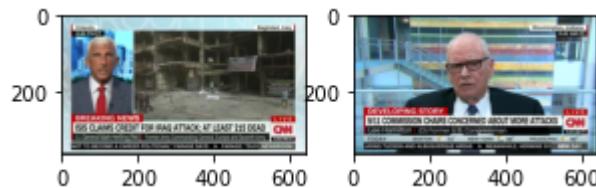
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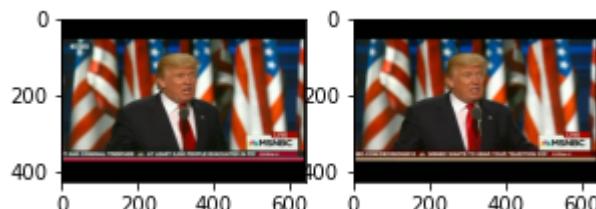
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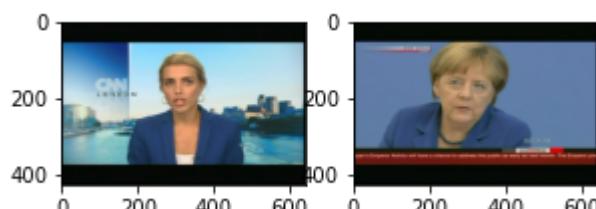
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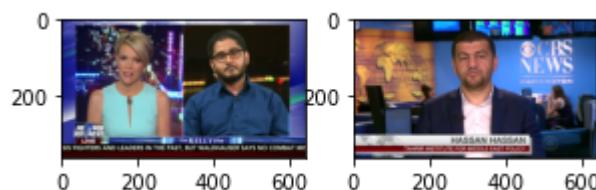
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CLUSTER--> 121 TOTAL IMAGES--> 2



CLUSTER--> 122 TOTAL IMAGES--> 3



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CLUSTER--> 125 TOTAL IMAGES--> 3



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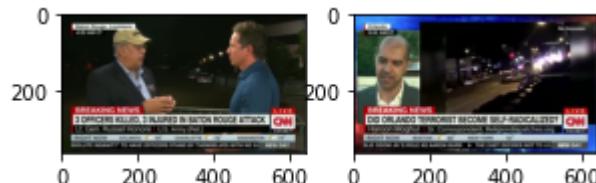
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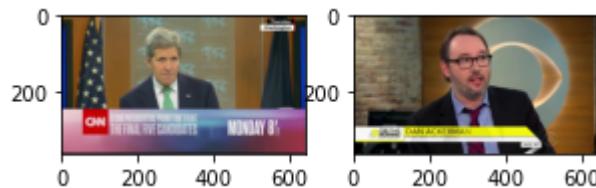
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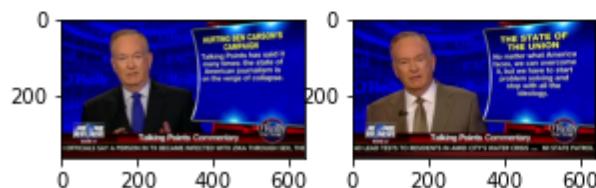
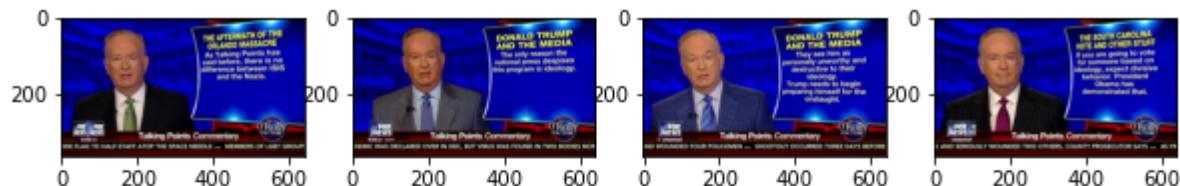
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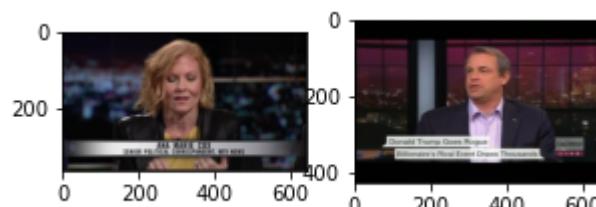
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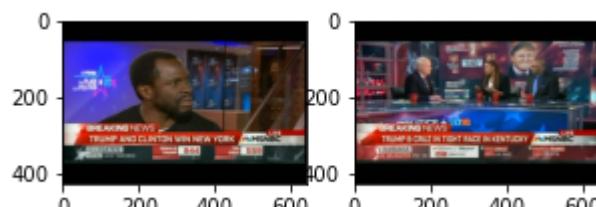
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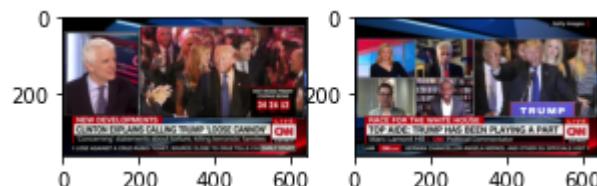
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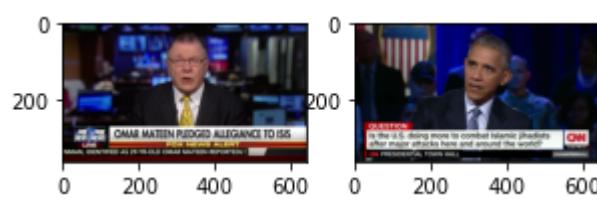
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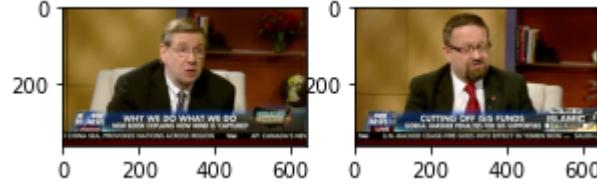
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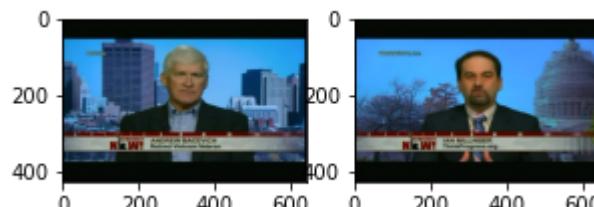
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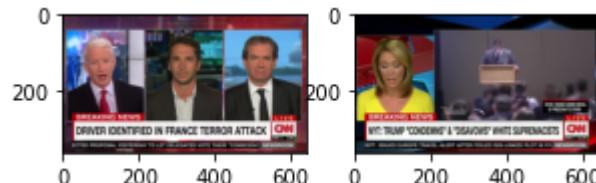
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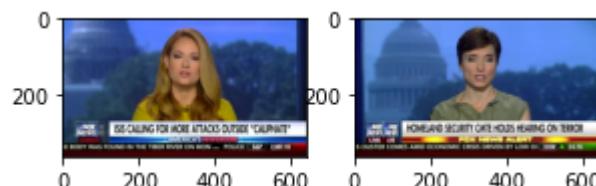
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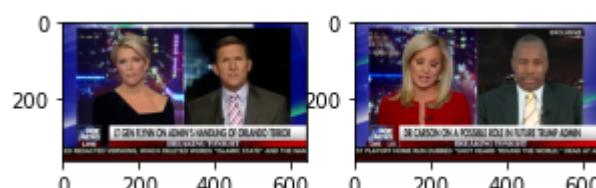
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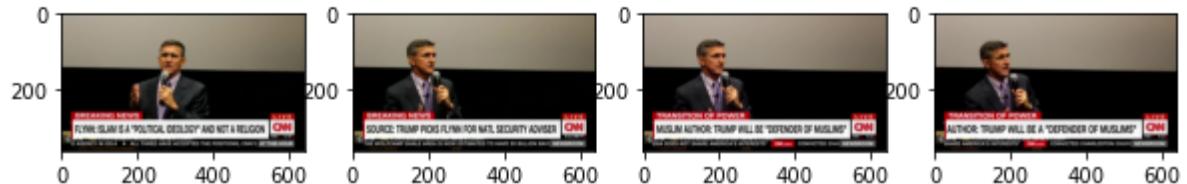
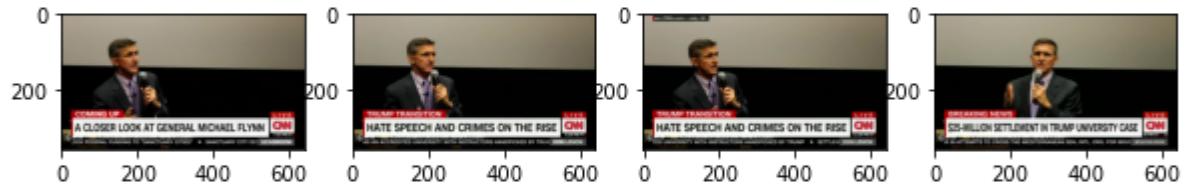
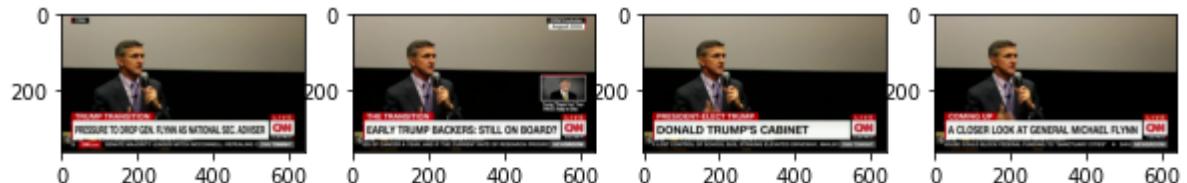
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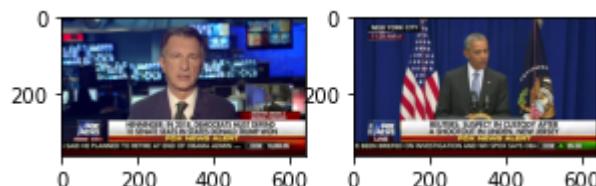
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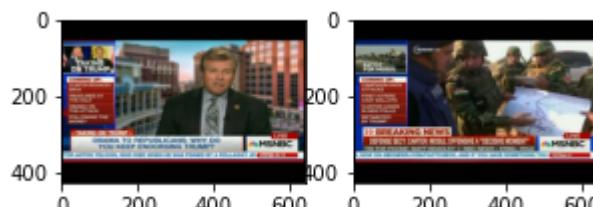
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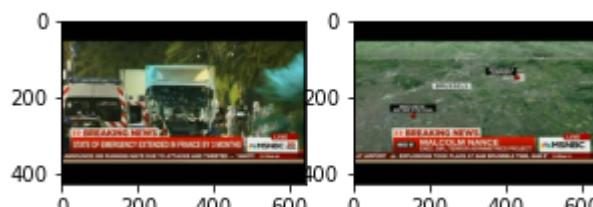
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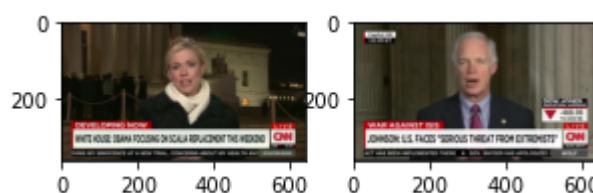
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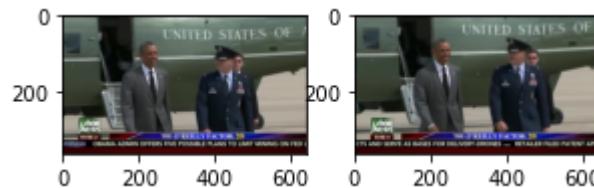
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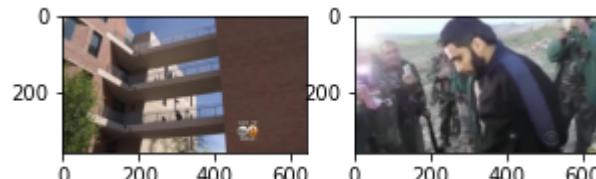
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CLUSTER--> 176 TOTAL IMAGES--> 2



CLUSTER--> 177 TOTAL IMAGES--> 2



CLUSTER--> 178 TOTAL IMAGES--> 2



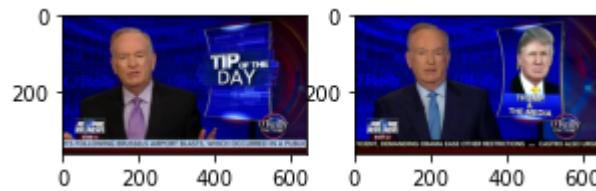
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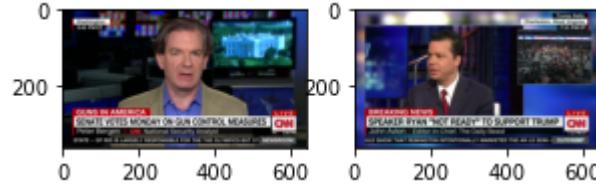
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CLUSTER--> 181 TOTAL IMAGES--> 2



CLUSTER--> 182 TOTAL IMAGES--> 2



CLUSTER--> 183 TOTAL IMAGES--> 3



CLUSTER--> 184 TOTAL IMAGES--> 2



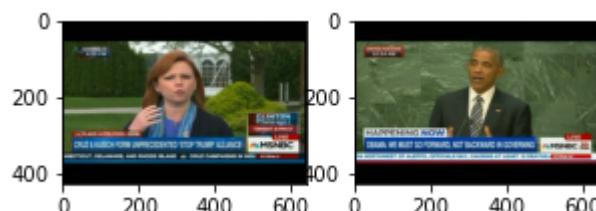
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CLUSTER--> 186 TOTAL IMAGES--> 3



CLUSTER--> 187 TOTAL IMAGES--> 2



CLUSTER--> 188 TOTAL IMAGES--> 2



CLUSTER--> 189 TOTAL IMAGES--> 2



CLUSTER--> 190 TOTAL IMAGES--> 3



CLUSTER--> 191 TOTAL IMAGES--> 2



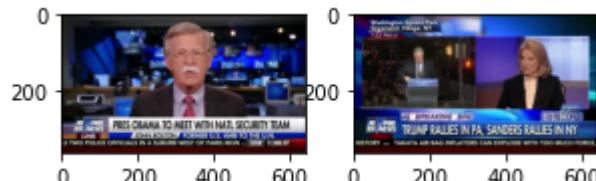
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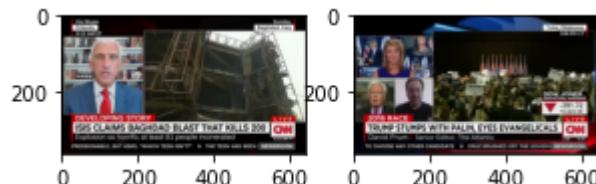
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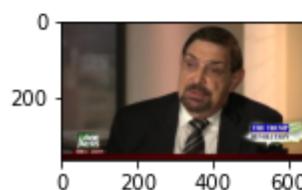
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CLUSTER--> 195 TOTAL IMAGES--> 2



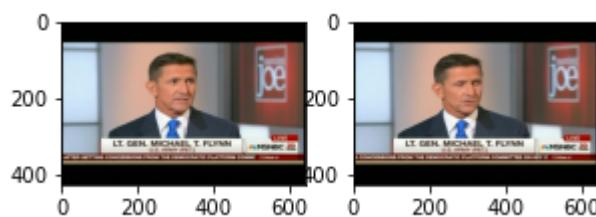
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CLUSTER--> 197 TOTAL IMAGES--> 2



CLUSTER--> 198 TOTAL IMAGES--> 2



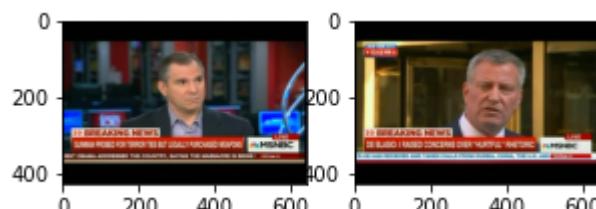
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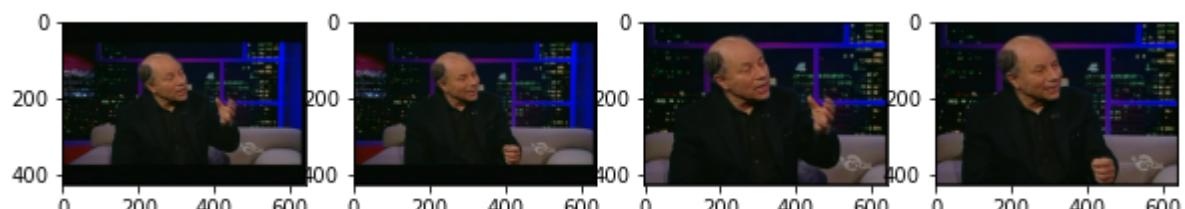
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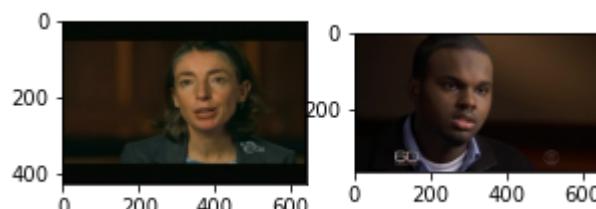
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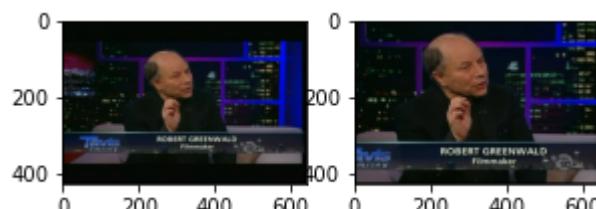
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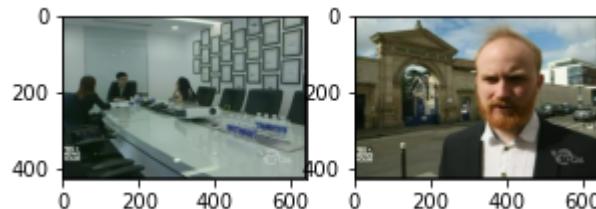
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CLUSTER--> 204 TOTAL IMAGES--> 2



CLUSTER--> 205 TOTAL IMAGES--> 2



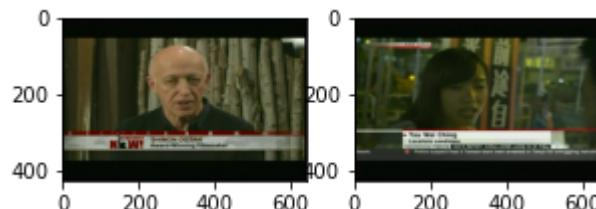
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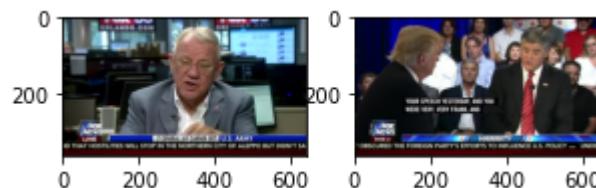
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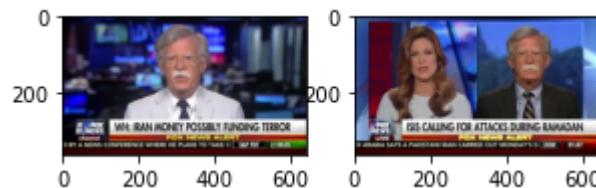
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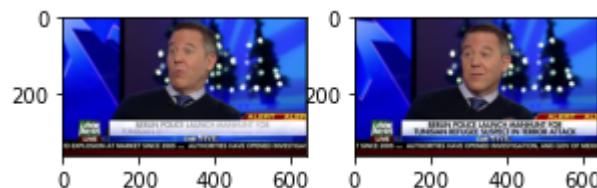
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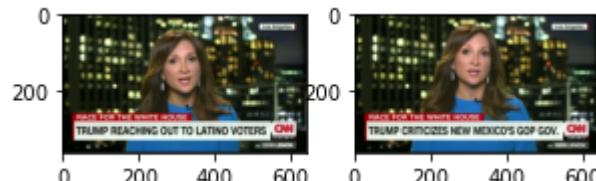
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CLUSTER--> 216 TOTAL IMAGES--> 4



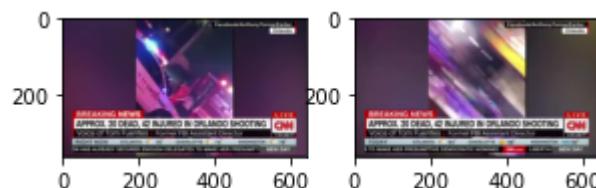
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CLUSTER--> 218 TOTAL IMAGES--> 3



CLUSTER--> 219 TOTAL IMAGES--> 2



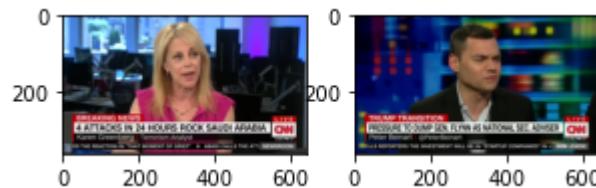
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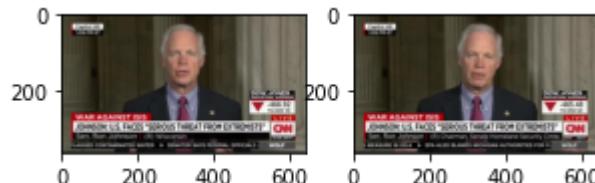
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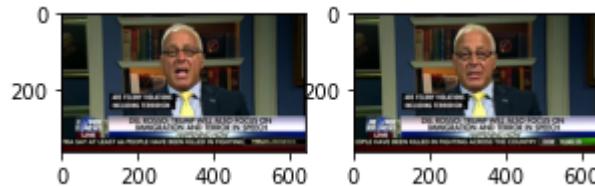
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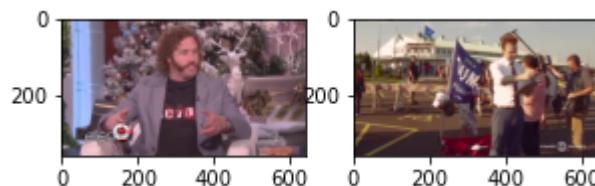
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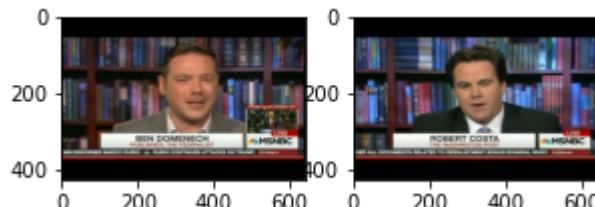
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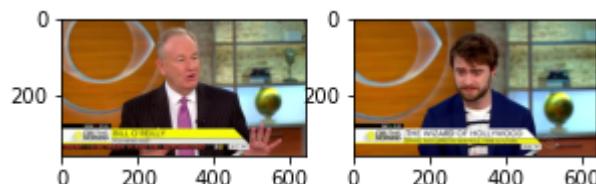
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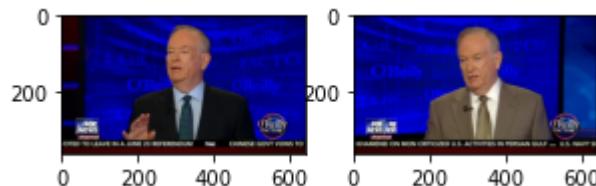
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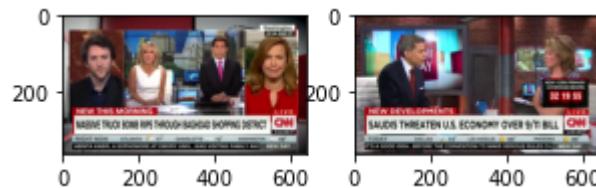
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CLUSTER--> 235 TOTAL IMAGES--> 2



CLUSTER--> 236 TOTAL IMAGES--> 2



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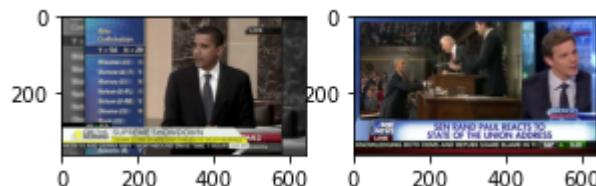
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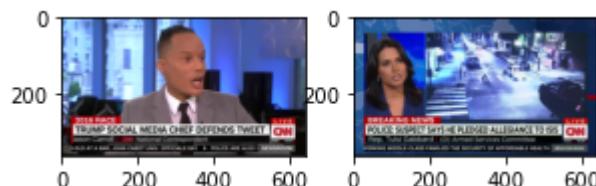
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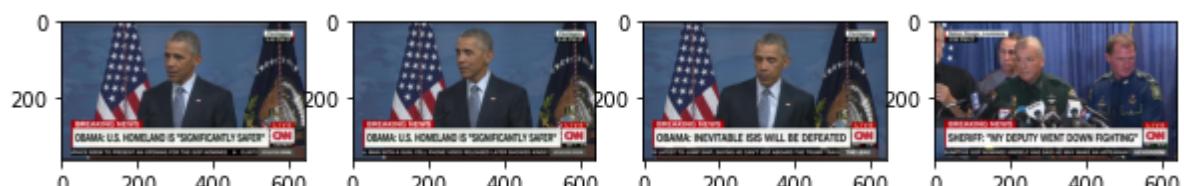
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CLUSTER--> 245 TOTAL IMAGES--> 2



CLUSTER--> 246 TOTAL IMAGES--> 4



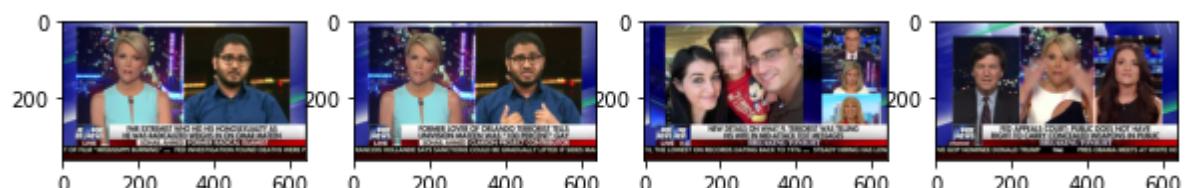
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CLUSTER--> 248 TOTAL IMAGES--> 3



CLUSTER--> 249 TOTAL IMAGES--> 4



CLUSTER--> 250 TOTAL IMAGES--> 2



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