

# L4 Exercise 4 - Video Analyzer Exercise Solution

November 25, 2022

```
In [128]: ! activate ai-azure-c1
```

```
import sys
```

```
sys.path.append("/opt/conda/envs/ai-azure-c1/lib/python3.8/site-packages")
```

```
In [129]: !pip install Pillow==8.4
```

Requirement already satisfied: Pillow==8.4 in /opt/conda/lib/python3.6/site-packages (8.4.0)

```
In [130]: import io
```

```
import datetime
```

```
import pandas as pd
```

```
from PIL import Image
```

```
import requests
```

```
import io
```

```
import glob, os, sys, time, uuid
```

```
from matplotlib.pyplot import imshow
```

```
import matplotlib.pyplot as plt
```

```
%matplotlib inline
```

```
from urllib.parse import urlparse
```

```
from io import BytesIO
```

```
from PIL import Image, ImageDraw
```

```
from video_indexer import VideoIndexer
```

```
from azure.cognitiveservices.vision.face import FaceClient
```

```
from azure.cognitiveservices.vision.face.models import TrainingStatusType
```

```
from msrest.authentication import CognitiveServicesCredentials
```

```
In [131]: video_analysis = VideoIndexer(  
    vi_subscription_key='080f710d4f8545e9bfd9794541a904aa',  
    vi_location="trial",  
    vi_account_id="2f105a34-4008-4ad7-9c50-ae8747db92c9"  
)
```

# 1 Upload Video

```
In [ ]: uploaded_video_id = video_analysis.upload_to_video_indexer(  
    input_filename='/home/workspace/avkash-boarding-pass.mp4',  
    video_name='avkash-boarding-pass', # unique identifier for video in Video Indexer pl  
    video_language='English'  
)
```

```
In [140]: info = video_analysis.get_video_info(uploaded_video_id, video_language='English')
```

Getting video info for: 195f502b8f

```
In [141]: video_analysis.check_access_token()
```

```
In [142]: video_id = '195f502b8f'
```

```
In [143]: video_analysis.get_video_info(video_id)
```

Getting video info for: 195f502b8f

```
Out[143]: {'partition': None,  
    'description': None,  
    'privacyMode': 'Private',  
    'state': 'Processed',  
    'accountId': '2f105a34-4008-4ad7-9c50-ae8747db92c9',  
    'id': '195f502b8f',  
    'name': 'avkash-boarding-pass',  
    'userName': 'ODL_User 216623',  
    'created': '2022-11-25T18:22:29.3153+00:00',  
    'isOwned': True,  
    'isEditable': True,  
    'isBase': True,  
    'durationInSeconds': 26,  
    'duration': '0:00:26.499856',  
    'summarizedInsights': {'name': 'avkash-boarding-pass',  
    'id': '195f502b8f',  
    'privacyMode': 'Private',  
    'duration': {'time': '0:00:26.499856', 'seconds': 26.5},  
    'thumbnailVideoId': '195f502b8f',  
    'thumbnailId': 'a9f1dab5-748b-4926-9d88-f54a5c1dfe74',  
    'faces': [{'videoId': '195f502b8f',  
    'confidence': 0,  
    'description': None,  
    'title': None,  
    'thumbnailId': '414bf4af-a839-4391-a911-b01acd51efc4',  
    'seenDuration': 26.4,  
    'seenDurationRatio': 0.9962,
```

```

'id': 1000,
'name': 'Unknown #1',
'appearances': [{'startTime': '0:00:00',
'endTime': '0:00:26.3666666',
'startSeconds': 0,
'endSeconds': 26.4}]],
'keywords': [{'isTranscript': True,
'id': 1,
'name': 'pass',
'appearances': [{'startTime': '0:00:13.01',
'endTime': '0:00:13.59',
'startSeconds': 13,
'endSeconds': 13.6},
{'startTime': '0:00:20.97',
'endTime': '0:00:22.34',
'startSeconds': 21,
'endSeconds': 22.3}]],
'sentiments': [],
'emotions': [],
'audioEffects': [],
'labels': [{'id': 1,
'name': 'wall',
'appearances': [{'confidence': 0.9928,
'startTime': '0:00:00',
'endTime': '0:00:26.1648384',
'startSeconds': 0,
'endSeconds': 26.2}]],
{'id': 2,
'name': 'human face',
'appearances': [{'confidence': 0.9929,
'startTime': '0:00:00',
'endTime': '0:00:26.1648384',
'startSeconds': 0,
'endSeconds': 26.2}]],
{'id': 3,
'name': 'person',
'appearances': [{'confidence': 0.9908,
'startTime': '0:00:00',
'endTime': '0:00:26.1648384',
'startSeconds': 0,
'endSeconds': 26.2}]],
{'id': 4,
'name': 'indoor',
'appearances': [{'confidence': 0.9881,
'startTime': '0:00:00',
'endTime': '0:00:26.1648384',
'startSeconds': 0,
'endSeconds': 26.2}]]],

```

```

'framePatterns': [],
'brands': [],
'namedLocations': [{ 'referenceId': None,
  'referenceUrl': None,
  'confidence': 0.99,
  'description': None,
  'seenDuration': 1.5,
  'id': 1,
  'name': 'kiosk',
  'appearances': [{ 'startTime': '0:00:04.54',
    'endTime': '0:00:05.95',
    'startSeconds': 4.5,
    'endSeconds': 6}]]],
'namedPeople': [],
'statistics': { 'correspondenceCount': 13,
  'speakerTalkToListenRatio': { '1': 0.185,
    '2': 0.285,
    '3': 0.241,
    '4': 0.288},
  'speakerLongestMonolog': { '1': 1, '2': 2, '3': 2, '4': 2},
  'speakerNumberOfFragments': { '1': 3, '2': 3, '3': 5, '4': 3},
  'speakerWordCount': { '1': 9, '2': 13, '3': 11, '4': 9}},
'topics': [{ 'referenceUrl': None,
  'iptcName': None,
  'iabName': None,
  'confidence': 0.702,
  'id': 1,
  'name': 'Airports',
  'appearances': [{ 'startTime': '0:00:00',
    'endTime': '0:00:26.499856',
    'startSeconds': 0,
    'endSeconds': 26.5}]]],
{ 'referenceUrl': None,
  'iptcName': None,
  'iabName': None,
  'confidence': 0.5278,
  'id': 2,
  'name': 'Onboarding',
  'appearances': [{ 'startTime': '0:00:00',
    'endTime': '0:00:26.499856',
    'startSeconds': 0,
    'endSeconds': 26.5}]]],
{ 'referenceUrl': None,
  'iptcName': None,
  'iabName': None,
  'confidence': 0.3923,
  'id': 3,
  'name': 'Airport Security',

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```

    'appearances': [{ 'startTime': '0:00:00',
                        'endTime': '0:00:26.499856',
                        'startSeconds': 0,
                        'endSeconds': 26.5}]],
    {'referenceUrl': None,
      'iptcName': 'arts, culture and entertainment',
      'iabName': 'Fine Art',
      'confidence': 0.3858,
      'id': 4,
      'name': 'Design/Interaction Design',
      'appearances': [{ 'startTime': '0:00:00',
                          'endTime': '0:00:26.499856',
                          'startSeconds': 0,
                          'endSeconds': 26.5}]],
    {'referenceUrl': None,
      'iptcName': 'Lifestyle and Leisure/travel and commuting',
      'iabName': 'Travel',
      'confidence': 0.3375,
      'id': 5,
      'name': 'Tourism/Visiting and Travel/Flying',
      'appearances': [{ 'startTime': '0:00:00',
                          'endTime': '0:00:26.499856',
                          'startSeconds': 0,
                          'endSeconds': 26.5}]]}],
'videos': [{ 'accountId': '2f105a34-4008-4ad7-9c50-ae8747db92c9',
              'id': '195f502b8f',
              'state': 'Processed',
              'moderationState': 'OK',
              'reviewState': 'None',
              'privacyMode': 'Private',
              'processingProgress': '100%',
              'failureCode': 'None',
              'failureMessage': '',
              'externalId': None,
              'externalUrl': None,
              'metadata': None,
              'insights': { 'version': '1.0.0.0',
                            'duration': '0:00:26.499856',
                            'sourceLanguage': 'en-US',
                            'sourceLanguages': ['en-US'],
                            'language': 'en-US',
                            'languages': ['en-US'],
                            'transcript': [{ 'id': 1,
                                              'text': 'So this is the video.',
                                              'confidence': 0.8253,
                                              'speakerId': 1,
                                              'language': 'en-US',
                                              'instances': [{ 'adjustedStart': '0:00:00.76',

```

```

        'adjustedEnd': '0:00:02.51',
        'start': '0:00:00.76',
        'end': '0:00:02.51']]],
    {'id': 2,
     'text': 'Where I am standing in.',
     'confidence': 0.8253,
     'speakerId': 2,
     'language': 'en-US',
     'instances': [{'adjustedStart': '0:00:02.62',
                     'adjustedEnd': '0:00:04.25',
                     'start': '0:00:02.62',
                     'end': '0:00:04.25'}]],
    {'id': 3,
     'text': 'Front.',
     'confidence': 0.8253,
     'speakerId': 3,
     'language': 'en-US',
     'instances': [{'adjustedStart': '0:00:04.26',
                     'adjustedEnd': '0:00:04.53',
                     'start': '0:00:04.26',
                     'end': '0:00:04.53'}]],
    {'id': 4,
     'text': 'Of the kiosk.',
     'confidence': 0.8253,
     'speakerId': 1,
     'language': 'en-US',
     'instances': [{'adjustedStart': '0:00:04.54',
                     'adjustedEnd': '0:00:05.95',
                     'start': '0:00:04.54',
                     'end': '0:00:05.95'}]],
    {'id': 5,
     'text': "And I'm.",
     'confidence': 0.8253,
     'speakerId': 3,
     'language': 'en-US',
     'instances': [{'adjustedStart': '0:00:06.06',
                     'adjustedEnd': '0:00:06.75',
                     'start': '0:00:06.06',
                     'end': '0:00:06.75'}]],
    {'id': 6,
     'text': "Pressing 2 buttons and I'm inserting my.",
     'confidence': 0.8253,
     'speakerId': 2,
     'language': 'en-US',
     'instances': [{'adjustedStart': '0:00:06.82',
                     'adjustedEnd': '0:00:09.78',
                     'start': '0:00:06.82',
                     'end': '0:00:09.78'}]],

```

```

{'id': 7,
 'text': 'Digital boarding.',
 'confidence': 0.8483,
 'speakerId': 4,
 'language': 'en-US',
 'instances': [{'adjustedStart': '0:00:11.57',
                  'adjustedEnd': '0:00:13',
                  'start': '0:00:11.57',
                  'end': '0:00:13'}]},
{'id': 8,
 'text': 'Pass.',
 'confidence': 0.8483,
 'speakerId': 2,
 'language': 'en-US',
 'instances': [{'adjustedStart': '0:00:13.01',
                  'adjustedEnd': '0:00:13.59',
                  'start': '0:00:13.01',
                  'end': '0:00:13.59'}]},
{'id': 9,
 'text': 'And.',
 'confidence': 0.8483,
 'speakerId': 3,
 'language': 'en-US',
 'instances': [{'adjustedStart': '0:00:13.69',
                  'adjustedEnd': '0:00:14.27',
                  'start': '0:00:13.69',
                  'end': '0:00:14.27'}]},
{'id': 10,
 'text': 'The instructions are there.',
 'confidence': 0.8959,
 'speakerId': 4,
 'language': 'en-US',
 'instances': [{'adjustedStart': '0:00:15.72',
                  'adjustedEnd': '0:00:18.13',
                  'start': '0:00:15.72',
                  'end': '0:00:18.13'}]},
{'id': 11,
 'text': 'And.',
 'confidence': 0.8139,
 'speakerId': 3,
 'language': 'en-US',
 'instances': [{'adjustedStart': '0:00:19.08',
                  'adjustedEnd': '0:00:19.68',
                  'start': '0:00:19.08',
                  'end': '0:00:19.68'}]},
{'id': 12,
 'text': 'The boarding pass.',
 'confidence': 0.8682,

```

```

'speakerId': 4,
'language': 'en-US',
'instances': [{ 'adjustedStart': '0:00:20.97',
  'adjustedEnd': '0:00:22.34',
  'start': '0:00:20.97',
  'end': '0:00:22.34' } ] },
{'id': 13,
'text': 'Is.',
'confidence': 0.8682,
'speakerId': 1,
'language': 'en-US',
'instances': [{ 'adjustedStart': '0:00:22.35',
  'adjustedEnd': '0:00:22.54',
  'start': '0:00:22.35',
  'end': '0:00:22.54' } ] },
{'id': 14,
'text': "Accepted and I'm good to go.",
'confidence': 0.8682,
'speakerId': 3,
'language': 'en-US',
'instances': [{ 'adjustedStart': '0:00:22.55',
  'adjustedEnd': '0:00:24.77',
  'start': '0:00:22.55',
  'end': '0:00:24.77' } ] },
'keywords': [{ 'id': 1,
'text': 'pass',
'confidence': 0.8041,
'language': 'en-US',
'instances': [{ 'adjustedStart': '0:00:13.01',
  'adjustedEnd': '0:00:13.59',
  'start': '0:00:13.01',
  'end': '0:00:13.59' },
{ 'adjustedStart': '0:00:20.97',
  'adjustedEnd': '0:00:22.34',
  'start': '0:00:20.97',
  'end': '0:00:22.34' } ] },
'topics': [{ 'id': 1,
'name': 'Airports',
'referenceId': 'Airports',
'referenceType': 'VideoIndexer',
'confidence': 0.702,
'iabName': None,
'language': 'en-US',
'instances': [{ 'adjustedStart': '0:00:00',
  'adjustedEnd': '0:00:26.499856',
  'start': '0:00:00',
  'end': '0:00:26.499856' } ] },
{'id': 2,

```



```

    'name': 'Onboarding',
    'referenceId': 'Onboarding',
    'referenceType': 'VideoIndexer',
    'confidence': 0.5278,
    'iabName': None,
    'language': 'en-US',
    'instances': [{ 'adjustedStart': '0:00:00',
                     'adjustedEnd': '0:00:26.499856',
                     'start': '0:00:00',
                     'end': '0:00:26.499856' } ] },
    { 'id': 3,
      'name': 'Airport Security',
      'referenceId': 'Airport Security',
      'referenceType': 'VideoIndexer',
      'confidence': 0.3923,
      'iabName': None,
      'language': 'en-US',
      'instances': [{ 'adjustedStart': '0:00:00',
                       'adjustedEnd': '0:00:26.499856',
                       'start': '0:00:00',
                       'end': '0:00:26.499856' } ] },
    { 'id': 4,
      'name': 'Interaction Design',
      'referenceId': 'Design/Interaction Design',
      'referenceType': 'VideoIndexer',
      'iptcName': 'arts, culture and entertainment',
      'confidence': 0.3858,
      'iabName': 'Fine Art',
      'language': 'en-US',
      'instances': [{ 'adjustedStart': '0:00:00',
                       'adjustedEnd': '0:00:26.499856',
                       'start': '0:00:00',
                       'end': '0:00:26.499856' } ] },
    { 'id': 5,
      'name': 'Flying',
      'referenceId': 'Tourism/Visiting and Travel/Flying',
      'referenceType': 'VideoIndexer',
      'iptcName': 'Lifestyle and Leisure/travel and commuting',
      'confidence': 0.3375,
      'iabName': 'Travel',
      'language': 'en-US',
      'instances': [{ 'adjustedStart': '0:00:00',
                       'adjustedEnd': '0:00:26.499856',
                       'start': '0:00:00',
                       'end': '0:00:26.499856' } ] } ],
    'faces': [{ 'id': 1000,
                  'name': 'Unknown #1',
                  'confidence': 0,

```

```

'description': None,
'thumbnailId': '414bf4af-a839-4391-a911-b01acd51efc4',
'title': None,
'imageUrl': None,
'thumbnails': [{ 'id': '1955c2c7-9ccd-48a7-a4f1-63042ce1e73f',
  'fileName': 'FaceInstanceThumbnail_1955c2c7-9ccd-48a7-a4f1-63042ce1e73f.jpg',
  'instances': [{ 'adjustedStart': '0:00:00',
    'adjustedEnd': '0:00:00.0335195',
    'start': '0:00:00',
    'end': '0:00:00.0335195' } ] },
{ 'id': '51f298e1-ed86-44e6-b18c-9790be027c30',
  'fileName': 'FaceInstanceThumbnail_51f298e1-ed86-44e6-b18c-9790be027c30.jpg',
  'instances': [{ 'adjustedStart': '0:00:05.2494777',
    'adjustedEnd': '0:00:05.2829972',
    'start': '0:00:05.2494777',
    'end': '0:00:05.2829972' } ] },
{ 'id': '218e109f-488e-4e56-87a0-af665e99dcb3',
  'fileName': 'FaceInstanceThumbnail_218e109f-488e-4e56-87a0-af665e99dcb3.jpg',
  'instances': [{ 'adjustedStart': '0:00:10.3860333',
    'adjustedEnd': '0:00:10.4195528',
    'start': '0:00:10.3860333',
    'end': '0:00:10.4195528' } ] },
{ 'id': 'd2bb58fb-2180-4471-915f-2ac03d517afc',
  'fileName': 'FaceInstanceThumbnail_d2bb58fb-2180-4471-915f-2ac03d517afc.jpg',
  'instances': [{ 'adjustedStart': '0:00:15.5229111',
    'adjustedEnd': '0:00:15.5564306',
    'start': '0:00:15.5229111',
    'end': '0:00:15.5564306' } ] },
{ 'id': 'b173a266-3b6f-49a9-9ef2-65f5440ebfaf',
  'fileName': 'FaceInstanceThumbnail_b173a266-3b6f-49a9-9ef2-65f5440ebfaf.jpg',
  'instances': [{ 'adjustedStart': '0:00:20.6610111',
    'adjustedEnd': '0:00:20.6945306',
    'start': '0:00:20.6610111',
    'end': '0:00:20.6945306' } ] },
{ 'id': '414bf4af-a839-4391-a911-b01acd51efc4',
  'fileName': 'FaceInstanceThumbnail_414bf4af-a839-4391-a911-b01acd51efc4.jpg',
  'instances': [{ 'adjustedStart': '0:00:25.7994111',
    'adjustedEnd': '0:00:25.8329306',
    'start': '0:00:25.7994111',
    'end': '0:00:25.8329306' } ] } ],
'instances': [{ 'thumbnailsIds': ['51f298e1-ed86-44e6-b18c-9790be027c30',
  '1955c2c7-9ccd-48a7-a4f1-63042ce1e73f'],
  'adjustedStart': '0:00:00',
  'adjustedEnd': '0:00:07.9052666',
  'start': '0:00:00',
  'end': '0:00:07.9052666' },
{ 'thumbnailsIds': ['218e109f-488e-4e56-87a0-af665e99dcb3',
  'd2bb58fb-2180-4471-915f-2ac03d517afc'],

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      'adjustedStart': '0:00:07.9079',
      'adjustedEnd': '0:00:19.9132666',
      'start': '0:00:07.9079',
      'end': '0:00:19.9132666'}],
    {'thumbnailsIds': ['b173a266-3b6f-49a9-9ef2-65f5440ebfaf',
      '414bf4af-a839-4391-a911-b01acd51efc4'],
      'adjustedStart': '0:00:19.9198999',
      'adjustedEnd': '0:00:26.3666666',
      'start': '0:00:19.9198999',
      'end': '0:00:26.3666666'}]]],
  'labels': [{ 'id': 1,
    'name': 'wall',
    'referenceId': 'structure/wall',
    'language': 'en-US',
    'instances': [{ 'confidence': 0.9928,
      'adjustedStart': '0:00:00',
      'adjustedEnd': '0:00:26.1648384',
      'start': '0:00:00',
      'end': '0:00:26.1648384'}]}],
    { 'id': 2,
      'name': 'human face',
      'language': 'en-US',
      'instances': [{ 'confidence': 0.9929,
        'adjustedStart': '0:00:00',
        'adjustedEnd': '0:00:26.1648384',
        'start': '0:00:00',
        'end': '0:00:26.1648384'}]}],
    { 'id': 3,
      'name': 'person',
      'referenceId': 'person',
      'language': 'en-US',
      'instances': [{ 'confidence': 0.9908,
        'adjustedStart': '0:00:00',
        'adjustedEnd': '0:00:26.1648384',
        'start': '0:00:00',
        'end': '0:00:26.1648384'}]}],
    { 'id': 4,
      'name': 'indoor',
      'language': 'en-US',
      'instances': [{ 'confidence': 0.9881,
        'adjustedStart': '0:00:00',
        'adjustedEnd': '0:00:26.1648384',
        'start': '0:00:00',
        'end': '0:00:26.1648384'}]}],
  'scenes': [{ 'id': 1,
    'instances': [{ 'adjustedStart': '0:00:00',
      'adjustedEnd': '0:00:26.4804469',
      'start': '0:00:00',

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        'end': '0:00:26.4804469']]]],
'shots': [{ 'id': 1,
    'tags': ['ExtremeCloseUp', 'CenterFace'],
    'keyFrames': [{ 'id': 1,
        'instances': [{ 'thumbnailId': 'cf80a479-df41-4c66-a656-4198d24db4b6',
            'adjustedStart': '0:00:00.1675977',
            'adjustedEnd': '0:00:00.2011173',
            'start': '0:00:00.1675977',
            'end': '0:00:00.2011173'} ]}],
        { 'id': 2,
            'instances': [{ 'thumbnailId': 'ca8f5131-aeb0-4bb5-b66f-ae9891c70c75',
                'adjustedStart': '0:00:00.2011173',
                'adjustedEnd': '0:00:00.2346368',
                'start': '0:00:00.2011173',
                'end': '0:00:00.2346368'} ]}],
        'instances': [{ 'adjustedStart': '0:00:00',
            'adjustedEnd': '0:00:26.4804469',
            'start': '0:00:00',
            'end': '0:00:26.4804469'} ]}],
'namedLocations': [{ 'id': 1,
    'name': 'kiosk',
    'referenceId': None,
    'referenceUrl': None,
    'description': None,
    'tags': [],
    'confidence': 0.99,
    'isCustom': False,
    'instances': [{ 'instanceSource': 'Transcript',
        'adjustedStart': '0:00:04.54',
        'adjustedEnd': '0:00:05.95',
        'start': '0:00:04.54',
        'end': '0:00:05.95'} ]}],
'blocks': [{ 'id': 0,
    'instances': [{ 'adjustedStart': '0:00:00',
        'adjustedEnd': '0:00:26.499856',
        'start': '0:00:00',
        'end': '0:00:26.499856'} ]}],
'speakers': [{ 'id': 1,
    'name': 'Speaker #1',
    'instances': [{ 'adjustedStart': '0:00:00.76',
        'adjustedEnd': '0:00:02.51',
        'start': '0:00:00.76',
        'end': '0:00:02.51'},
        { 'adjustedStart': '0:00:04.54',
            'adjustedEnd': '0:00:05.95',
            'start': '0:00:04.54',
            'end': '0:00:05.95'},
        { 'adjustedStart': '0:00:22.35',
            'adjustedEnd': '0:00:26.4804469',
            'start': '0:00:22.35',
            'end': '0:00:26.4804469'} ]}],

```

```

        'adjustedEnd': '0:00:22.54',
        'start': '0:00:22.35',
        'end': '0:00:22.54']]],
    {'id': 2,
     'name': 'Speaker #2',
     'instances': [{'adjustedStart': '0:00:02.62',
                      'adjustedEnd': '0:00:04.25',
                      'start': '0:00:02.62',
                      'end': '0:00:04.25'},
                    {'adjustedStart': '0:00:06.82',
                      'adjustedEnd': '0:00:09.78',
                      'start': '0:00:06.82',
                      'end': '0:00:09.78'},
                    {'adjustedStart': '0:00:13.01',
                      'adjustedEnd': '0:00:13.59',
                      'start': '0:00:13.01',
                      'end': '0:00:13.59'}]],
    {'id': 3,
     'name': 'Speaker #3',
     'instances': [{'adjustedStart': '0:00:04.26',
                      'adjustedEnd': '0:00:04.53',
                      'start': '0:00:04.26',
                      'end': '0:00:04.53'},
                    {'adjustedStart': '0:00:06.06',
                      'adjustedEnd': '0:00:06.75',
                      'start': '0:00:06.06',
                      'end': '0:00:06.75'},
                    {'adjustedStart': '0:00:13.69',
                      'adjustedEnd': '0:00:14.27',
                      'start': '0:00:13.69',
                      'end': '0:00:14.27'},
                    {'adjustedStart': '0:00:19.08',
                      'adjustedEnd': '0:00:19.68',
                      'start': '0:00:19.08',
                      'end': '0:00:19.68'},
                    {'adjustedStart': '0:00:22.55',
                      'adjustedEnd': '0:00:24.77',
                      'start': '0:00:22.55',
                      'end': '0:00:24.77'}]],
    {'id': 4,
     'name': 'Speaker #4',
     'instances': [{'adjustedStart': '0:00:11.57',
                      'adjustedEnd': '0:00:13',
                      'start': '0:00:11.57',
                      'end': '0:00:13'},
                    {'adjustedStart': '0:00:15.72',
                      'adjustedEnd': '0:00:18.13',
                      'start': '0:00:15.72',

```

```

        'end': '0:00:18.13'},
        {'adjustedStart': '0:00:20.97',
         'adjustedEnd': '0:00:22.34',
         'start': '0:00:20.97',
         'end': '0:00:22.34'}]]],
'textualContentModeration': {'id': 0,
 'bannedWordsCount': 0,
 'bannedWordsRatio': 0,
 'instances': []},
'statistics': {'correspondenceCount': 13,
 'speakerTalkToListenRatio': {'1': 0.185,
 '2': 0.285,
 '3': 0.241,
 '4': 0.288},
 'speakerLongestMonolog': {'1': 1, '2': 2, '3': 2, '4': 2},
 'speakerNumberOfFragments': {'1': 3, '2': 3, '3': 5, '4': 3},
 'speakerWordCount': {'1': 9, '2': 13, '3': 11, '4': 9}},
'thumbnailId': 'a9f1dab5-748b-4926-9d88-f54a5c1dfe74',
'width': 1080,
'height': 720,
'detectSourceLanguage': False,
'languageAutoDetectMode': 'None',
'sourceLanguage': 'en-US',
'sourceLanguages': ['en-US'],
'language': 'en-US',
'languages': ['en-US'],
'indexingPreset': 'Default',
'linguisticModelId': '00000000-0000-0000-0000-000000000000',
'personModelId': '00000000-0000-0000-0000-000000000000',
'isAdult': False,
'publishedUrl': 'https://rodmandev.streaming.mediaservices.windows.net/1a0d6400-242
'publishedProxyUrl': None,
'viewToken': 'Bearer=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ1cm46bWljcm9zb2Z0OmF6d
'videosRanges': [{'videoId': '195f502b8f',
 'range': {'start': '0:00:00', 'end': '0:00:26.499856'}}}]}
```

```
In [176]: info = video_analysis.get_video_info(video_id, video_language='English')
```

```
Getting video info for: 195f502b8f
```

```
In [177]: if len(info['videos'][0]['insights']['faces'][0]['thumbnails']):
           print("We found {} faces in this video.".format(str(len(info['videos'][0]['insight
```

```
We found 6 faces in this video.
```

## 2 Display emotion and sentiments

```
In [178]: info['summarizedInsights']['sentiments']
```

```
Out[178]: []
```

```
In [179]: info['summarizedInsights']['emotions']
```

```
Out[179]: []
```

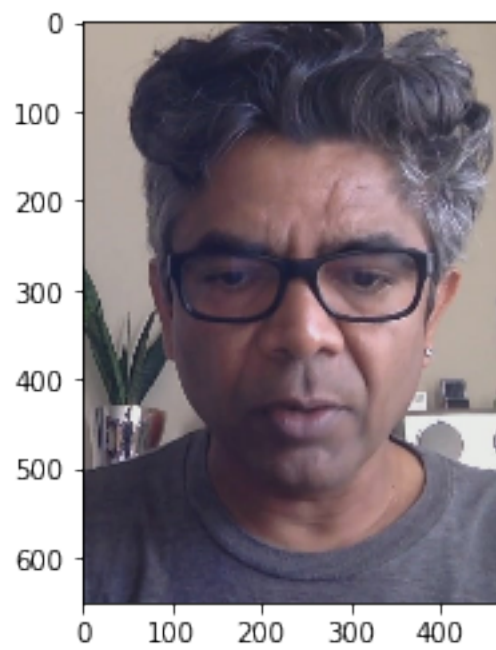
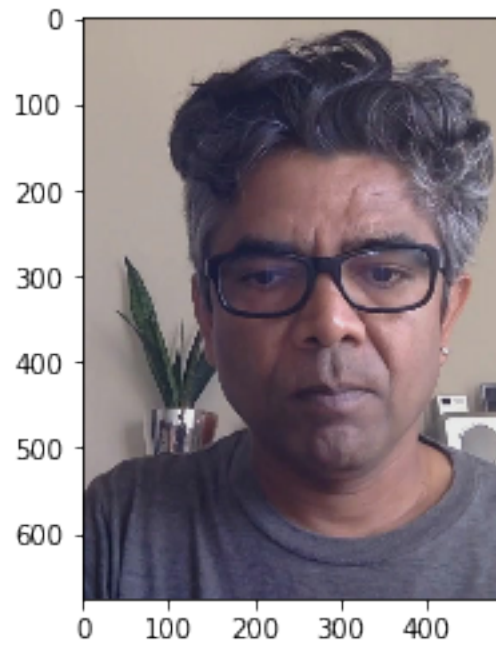
## 3 Show face thumbnails

```
In [180]: images = []
          img_raw = []
          img_strs = []
          for each_thumb in info['videos'][0]['insights']['faces'][0]['thumbnails']:
              if 'fileName' in each_thumb and 'id' in each_thumb:
                  file_name = each_thumb['fileName']
                  thumb_id = each_thumb['id']
                  img_code = video_analysis.get_thumbnail_from_video_indexer(video_id, thumb_id)
                  img_strs.append(img_code)
                  img_stream = io.BytesIO(img_code)
                  img_raw.append(img_stream)
                  img = Image.open(img_stream)
                  images.append(img)
```

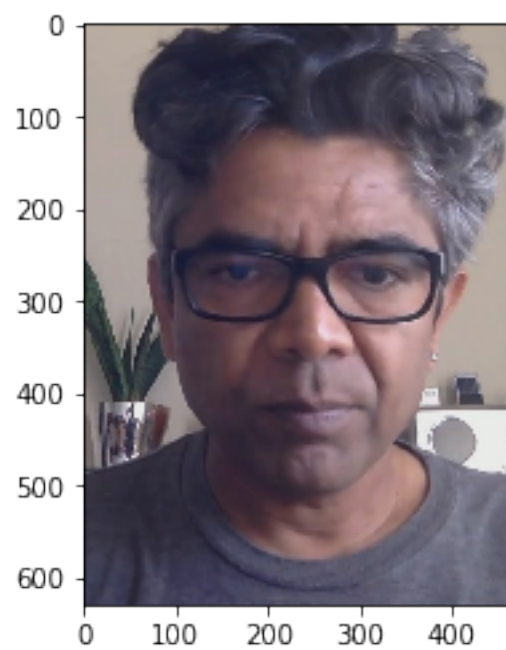
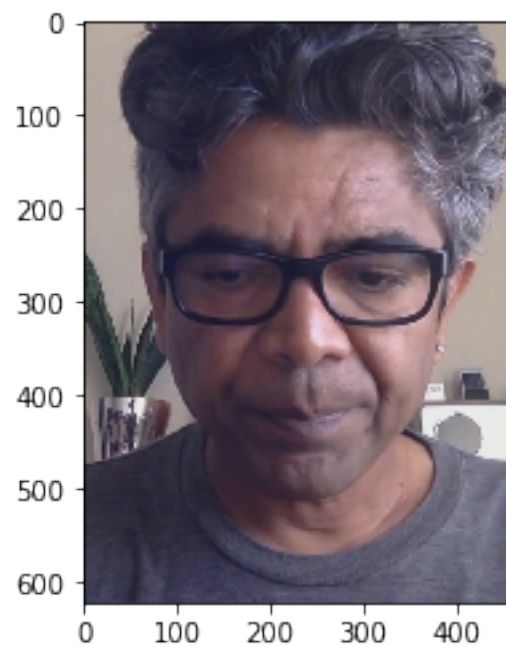
```
Getting thumbnail from video: 195f502b8f, thumbnail: 1955c2c7-9ccd-48a7-a4f1-63042ce1e73f
Getting thumbnail from video: 195f502b8f, thumbnail: 51f298e1-ed86-44e6-b18c-9790be027c30
Getting thumbnail from video: 195f502b8f, thumbnail: 218e109f-488e-4e56-87a0-af665e99dcb3
Getting thumbnail from video: 195f502b8f, thumbnail: d2bb58fb-2180-4471-915f-2ac03d517afc
Getting thumbnail from video: 195f502b8f, thumbnail: b173a266-3b6f-49a9-9ef2-65f5440ebfaf
Getting thumbnail from video: 195f502b8f, thumbnail: 414bf4af-a839-4391-a911-b01acd51efc4
```

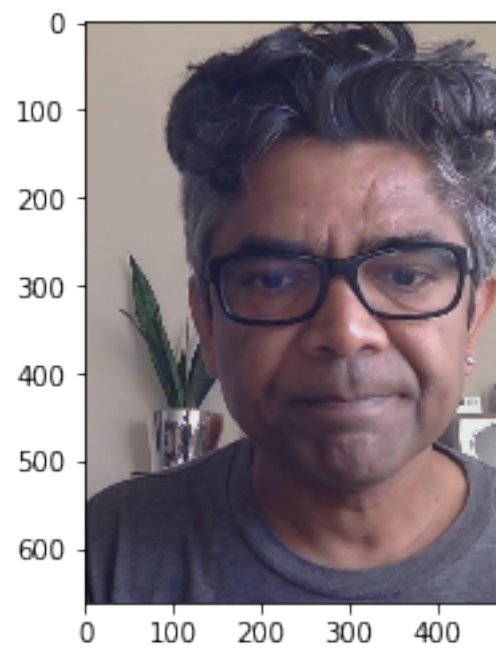
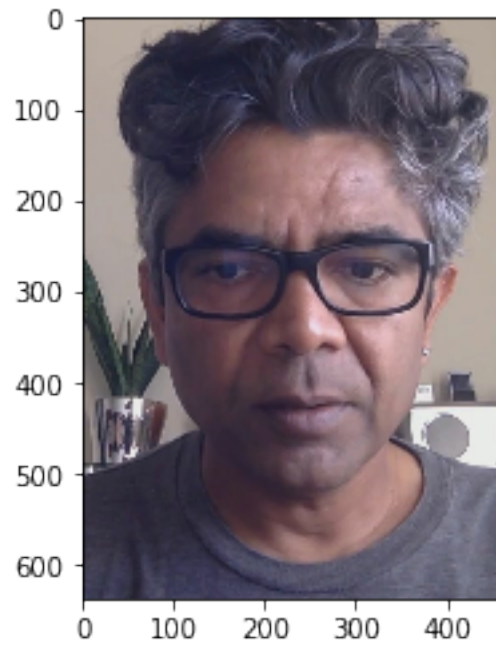
```
In [181]: for img in images:
          print(img.info)
          plt.figure()
          plt.imshow(img)
```

```
{'comment': b'Lavc59.18.100\x00'}
{'comment': b'Lavc59.18.100\x00'}
{'comment': b'Lavc59.18.100\x00'}
{'comment': b'Lavc59.18.100\x00'}
{'comment': b'Lavc59.18.100\x00'}
{'comment': b'Lavc59.18.100\x00'}
```









## 4 Save thumbnails to disk

```
In [ ]: i = 1
        for img in images:
            print(type(img))
            img.save('kiosk-face' + str(i) + '.jpg')
            i= i+ 1
```

## 5 Create FaceAPI client

```
In [152]: AVKASH_FACE_KEY = "d55dd882c50a4eadac2b17ee341e1bd0"
          AVKASH_FACE_ENDPOINT = "https://kiosk-face-api.cognitiveservices.azure.com/"
```

```
In [153]: # Create a client
          face_client = FaceClient(AVKASH_FACE_ENDPOINT, CognitiveServicesCredentials(AVKASH_FACE_KEY))
```

```
In [154]: face_client.api_version
```

```
Out[154]: '1.0'
```

## 6 Create Person model for thumbnails

```
In [192]: PERSON_GROUP_ID = str(uuid.uuid4())
          person_group_name = 'person-avkash-kiosk'
```

```
In [183]: ## This code is taken from Azure face SDK
          ## -----
          def build_person_group(client, person_group_id, pgp_name):
              print('Create and build a person group...')
              # Create empty Person Group. Person Group ID must be lower case, alphanumeric, and
              print('Person group ID:', person_group_id)
              client.person_group.create(person_group_id = person_group_id, name=person_group_id)

              # Create a person group person.
              my_face = client.person_group_person.create(person_group_id, pgp_name)
              # Find all jpeg images of human in working directory.
              my_face_images = [file for file in glob.glob('*.jpg') if file.startswith("kiosk-face")]
              # Add images to a Person object
              for image_p in my_face_images:
                  with open(image_p, 'rb') as w:
                      client.person_group_person.add_face_from_stream(person_group_id, my_face.p

              # Train the person group, after a Person object with many images were added to it.
              client.person_group.train(person_group_id)

              # Wait for training to finish.
              while (True):
                  training_status = client.person_group.get_training_status(person_group_id)
```

```

print("Training status: {}".format(training_status.status))
if (training_status.status is TrainingStatusType.succeeded):
    break
elif (training_status.status is TrainingStatusType.failed):
    client.person_group.delete(person_group_id=PERSON_GROUP_ID)
    sys.exit('Training the person group has failed.')
time.sleep(5)

```

```
In [196]: build_person_group(face_client, PERSON_GROUP_ID, person_group_name)
```

Create and build a person group...

Person group ID: 724ac8d9-b401-4154-9742-e70f7ded8c21

Training status: running.

Training status: succeeded.

## 7 Avkash ID is verified via Face API

```
In [197]: dl_faces = face_client.face.detect_with_url("https://raw.githubusercontent.com/natebue
dl_faces[0].face_id
```

```
Out[197]: 'a1381337-9e94-4630-b999-44528a799086'
```

```
In [201]: # Enter the face ID of ca-dl-sample.png from the output of the cell above
get_the_face_id_from_the_sample = 'a1381337-9e94-4630-b999-44528a799086'
```

```
In [202]: person_gp_results = face_client.face.identify([get_the_face_id_from_the_sample], PERSON_GROUP_ID)
```

```
In [203]: for result in person_gp_results:
            if result.candidates:
                for candidate in result.candidates:
                    print("The Identity match confidence is {}".format(candidate.confidence))
            else:
                print("Can't verify the identity with the person group")
```

The Identity match confidence is 0.8152

```
In [ ]:
```