

Module3. Detecting Labels in Your Own Video Data

Intelligent Video Analytics with Deep Learning

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Module3. Detecting Labels in Your Own Video Data

Learn Python in 5 Minutes

<https://www.stavros.io/tutorials/python/>

파이썬의 특징

- 코드가 읽기 쉽다
- 문법이 **간결**하다
- 개발속도가 **빠르다**
- 프로그래밍이 **재밌다**



패키지 설치

- Python*

```
pip install package_name
```

* 단, 파이썬 쉘 밖에서 실행

패키지 사용

- Python

```
import package_name
```



- Python**

```
abc = ['a', 'b', 'c']  
abc.append('d')
```

```
print(abc[0])  
print(abc[1])
```

** "list"라 부름

딕셔너리

- Python

```
abc = {}  
abc['a'] = 1  
abc['b'] = 2  
  
print(abc['a'])
```


열 + 딕셔너리

- Python

```
li = []  
li.append({'a':1})  
  
print(li[0]['a'])
```

String concatenation

- Python

```
abc = ['a', 'b', 'c']  
  
' '.join(abc)
```

String substitution

- Python

```
'beat'.replace('b', 'n')
```

루프

- Python

```
for i in range(1,5):  
    print(i)
```

루프

- Python

```
a = range(1,4)
s = [i**2 for i in a]

print(sum(s))
```

함수

- Python

```
def jiggle(x):  
    return x + 1
```

파일 입력

- Python

```
import io

f = io.open('kaist.mp4', 'rb')
video = f.read()
f.close()
```

딕셔너리 + 열을 테이블로

- Python

```
import pandas as pd
```

```
df = pd.DataFrame([{'a':1, 'b':2},  
                   {'a':3, 'b':4}])
```

	a	b
0	1	2
1	3	4

테이블 CSV로 저장하기

- Python

```
import pandas as pd

df = pd.DataFrame([{'a':1, 'b':2},
                    {'a':3, 'b':4}])

df.to_csv('test.csv')
```

Google Cloud API

API란?

- **API(Application Programing Interface)**

- API는 응용 프로그램에서 사용할 수 있도록, 운영 체제나 프로그래밍 언어가 제공하는 기능을 제어할 수 있게 만든 인터페이스를 뜻한다.

- **인터페이스(Interface)**

- 인터페이스(interface)는 컴퓨터 시스템끼리 **정보를 교환하는 공유 경계**를 의미한다,
- 터치 스크린과 같은 일부 컴퓨터 하드웨어 장치들은 인터페이스를 통해 데이터를 송수신 할 수 있으며, 마우스나 마이크론 폰과 같은 장치들은 오직 시스템에 데이터를 전송만 하는 인터페이스를 제공한다.

REST API란?

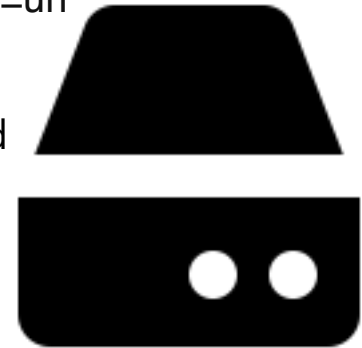
Client - Server 구조

1. 요청 (Request)



URI 방식으로 정보의 자원을 표현
Ex. <https://www.google.co.kr/search?q=uri>

자원에 대한 행위는 HTTP Method
Ex. GET, POST



REST API란?

Client - Server 구조

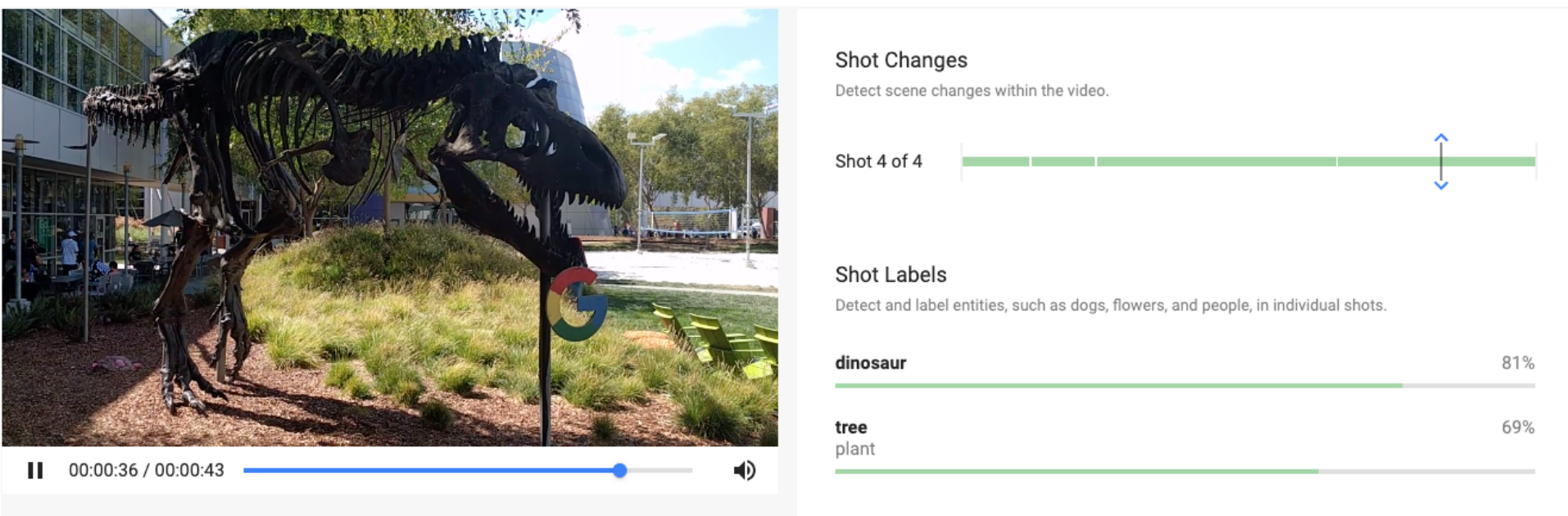
1. 요청 (Request)



2. 응답 (Response)
결과

Google Video Intelligence API

- The API detects the video labels (objects within the video) as well as shot labels (description of the video events over time)



The screenshot displays the Google Video Intelligence API interface. On the left, a video player shows a large dinosaur skeleton sculpture in an outdoor setting. The video progress bar indicates the video is at 00:00:36 of 00:00:43. On the right, the 'Shot Changes' section shows 'Shot 4 of 4' with a timeline. Below this, the 'Shot Labels' section lists detected entities: 'dinosaur' with an 81% confidence score and 'tree plant' with a 69% confidence score. Each label has a corresponding green progress bar indicating its duration in the video.

Shot Changes
Detect scene changes within the video.

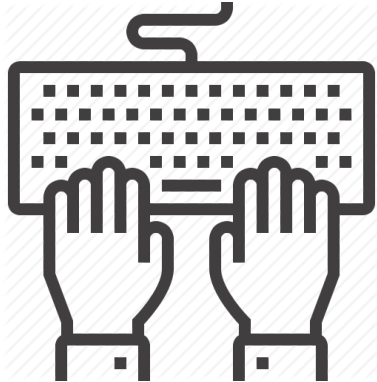
Shot 4 of 4

Shot Labels
Detect and label entities, such as dogs, flowers, and people, in individual shots.

Label	Confidence
dinosaur	81%
tree plant	69%

<https://cloud.google.com/video-intelligence/>

Hands-on-Labs Google Video Intelligence API



Google Video Intelligence API

KAIST_Video_Analytics.ipynb

URL: <https://bit.ly/2IOPeuI>

Google Drive Access on Colab

- First Step: Upload your data on Google Drive

<http://drive.google.com>

- **Second Step: Enter Authentication Code on Google Colab**

Mounting Google Drive locally

The example below shows how to mount your Google Drive in your virtual machine using Docker. Once executed, observe the new file (`foo.txt`) is visible in <https://drive.google.com/drive/folders/108vTtUgR9DQWzYXGfFmE6BjZlHnNk7>

Note this only supports reading and writing files; to programmatically change sharing

```
from google.colab import drive
drive.mount('/content/gdrive')
```

... Go to this URL in a browser: <https://accounts.google.com/o>

Enter your authorization code:

- Go to Url
- Type Code

Check Data Available on Google Drive

- Type: `!ls "/content/gdrive/My Drive/"`
 - This is root directory for Google Drive
- For a specific folder, `!ls "/content/gdrive/My Drive/{Your Folder Name}"`

```
# CHECK FILE EXIST  
!ls "{DATA_PATH}"
```

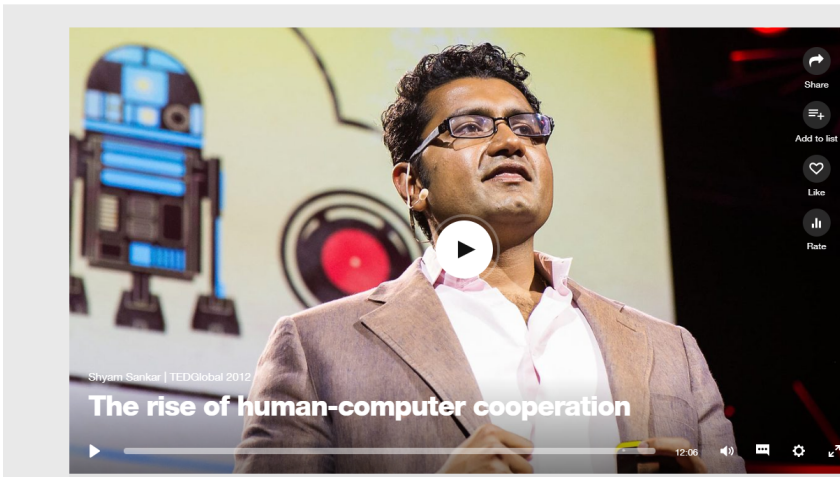
```
google-cloud-sdk-228.0.0-linux-x86_64.tar.gz  key.json  
kaist.mp4                                     segment_df.csv  
KAIST_Video_Analytics.ipynb                  shot_df.csv
```

Conclusion

Let's Cooperate with Deep Learning

- Analytic capability consists of human, computer, and human-computer cooperation.

TED Ideas worth spreading



https://www.ted.com/talks/shyam_sankar_the_rise_of_human_computer_cooperation

“In a freestyle chess tournament in 2005... The surprise came at the end. Who won? Not a grandmaster with a supercomputer, but actually two American amateurs using three relatively weak laptops ...

This is an astonishing result: average men, average machines beating the best man, the best machine. And anyways, isn't it supposed to be man versus machine? **Instead, it's about cooperation, and the right type of cooperation.**”

- Shyam Sankar at TEDGlobal 2012

Thank you ☺

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참고자료

- Python
 - 박은정, [Introduction to Python \(on Windows\)](#)