Module3. Detecting Labels in Your Own Video Data

Intelligent Video Analytics with Deep Learning

Jongho Kim

December & Company Inc.

Spring, 2019

KAIST
COLLEGE OF BUSINESS

Module3. Detecting Labels in Your Own Video Data

KAIST
COLLEGE OF BUSINESS

Learn Python in 5 Minutes

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

Jongho Kim (quantic.jh@gmail.com)

KAIST
COLLEGE OF BUSINESS

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`

열

- Python**

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

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

** "list"라 부름

Jongho Kim (quantic.jh@gmail.com)

KAIST
COLLEGE OF BUSINESS

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)
```

KAIST
COLLEGE OF BUSINESS

루프

- Python

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

print(sum(s))
```

함수

- Python

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

파일 입력

- Python

```
import io

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

KAIST
COLLEGE OF BUSINESS

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

KAIST
COLLEGE OF BUSINESS

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 <u>인터페이스</u>를 뜻한다.

- **인터페이스(Interface)**
  - 인터페이스(interface)는 컴퓨터 시스템끼리 정보를 교한하는 공유 경계를 의미한다,

  - 터치 스크린과 같은 일부 컴퓨터 하드웨어 장치들은 인터페이스를 통해 데이터를 송수신 할 수 있으며, 마우스나 마이크론 폰가 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
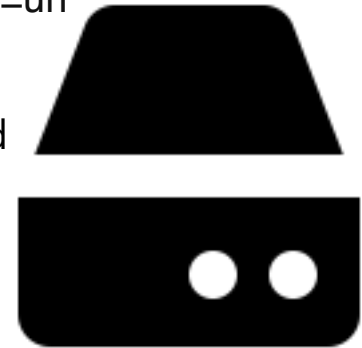
REST API란?

Client - Server 구조
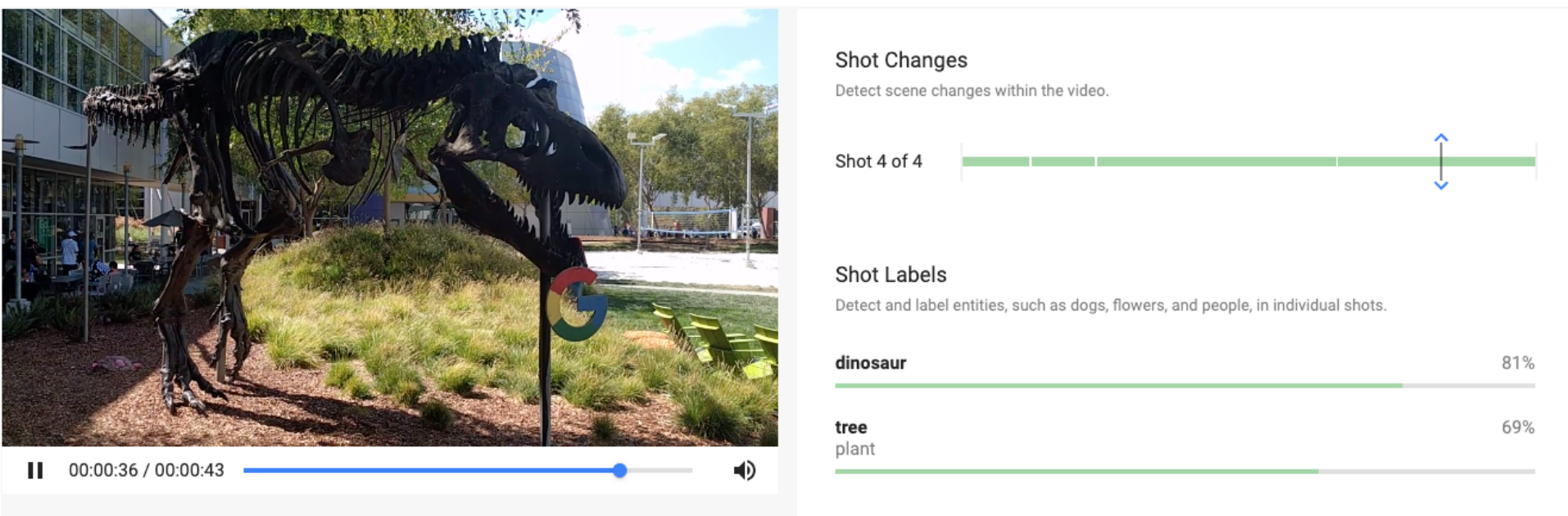
1. 요청 (Request)

2. 응답 (Response)
결과

KAIST
COLLEGE OF BUSINESS

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)

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

Hands-on-Labs Google Video Intelligence API

KAIST
COLLEGE OF BUSINESS

K Keras
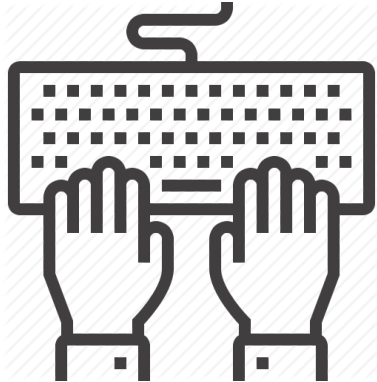
Google Video Intelligence API

KAIST_Video_Analytics.ipynb

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

KAIST
COLLEGE OF BUSINESS

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 us
files there. Once executed, observe the new file (foo.txt) is visible in https://drive.g

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

KAIST
COLLEGE OF BUSINESS

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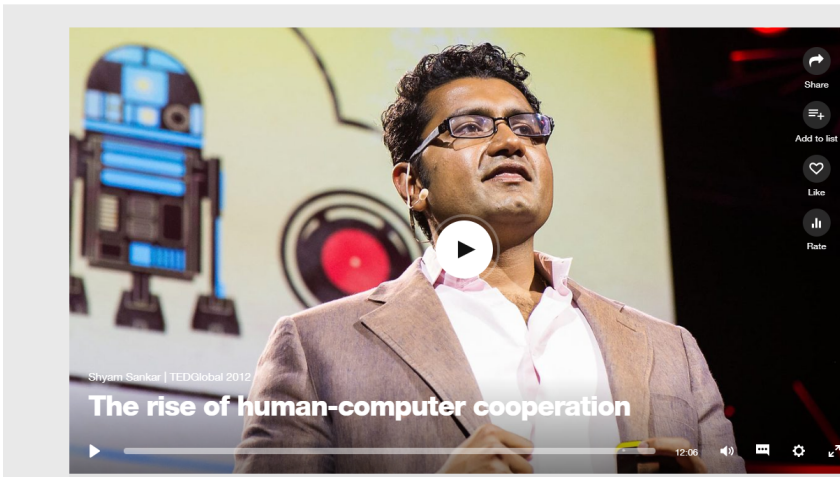
```
# CHECK FILE EXIST
!ls "{DATA_PATH}"
```

```
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.

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 ☺

Contact Info: quantic.jh@gmail.com

참고자료

- Python
  - 박은정, [Introduction to Python (on Windows)](#)
  - 김태훈, [140분의 파이썬](#)