

# **BIG DATA ANALYTICS**

**WEEK-16 | Application-3 AI/ML API**

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# AI/ML 도입의 어려움

- IT기반의 기업이 아닌 이상 AI/ML 관련 기술/인프라/인력을 확보하기가 쉽지 않음
- 하지만, 대부분의 기업 입장에서는 신사업을 개척하지 않는 한 기존 산업을 최적화하여 비용 절감 및 매출 증대를 노려야 함
- 직접 모델을 훈련하지 않고도, 쓸 수 있는 방법이 없을까?

# AlaaS

- A.I. as a Service
- 많은 IT 대기업들은 미리 훈련된 AI 모델이나 인프라를 Service로 써 제공함
- 비록 유료지만, 전체적인 비용을 생각했을 때 오히려 합리적인 방안
  - AI/ML 학습 및 배포 인프라 비용
  - AI/ML 인력 비용
- 특히, 범용적인 기술(Vision, NLP, Speech 등)에 대해서는 일반 기업이 더 좋은 모델을 만들어내기가 사실상 불가능

# Amazon Web Services

## The AWS ML Stack

Broadest and most complete set of Machine Learning capabilities

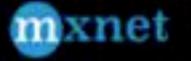
### AI SERVICES

VISION	SPEECH	TEXT	SEARCH <small>NEW</small>	CHATBOTS	PERSONALIZATION	FORECASTING	FRAUD <small>NEW</small>	DEVELOPMENT <small>NEW</small>	CONTACT CENTERS			
 Amazon Rekognition	 Amazon Polly	 Amazon Transcribe +Medical	 Amazon Comprehend +Medical	 Amazon Translate	 Amazon Textract	 Amazon Kendra	 Amazon Lex	 Amazon Personalize	 Amazon Forecast	 Amazon FraudDetector	 Amazon CodeGuru	 Amazon Connect with Contact Lens

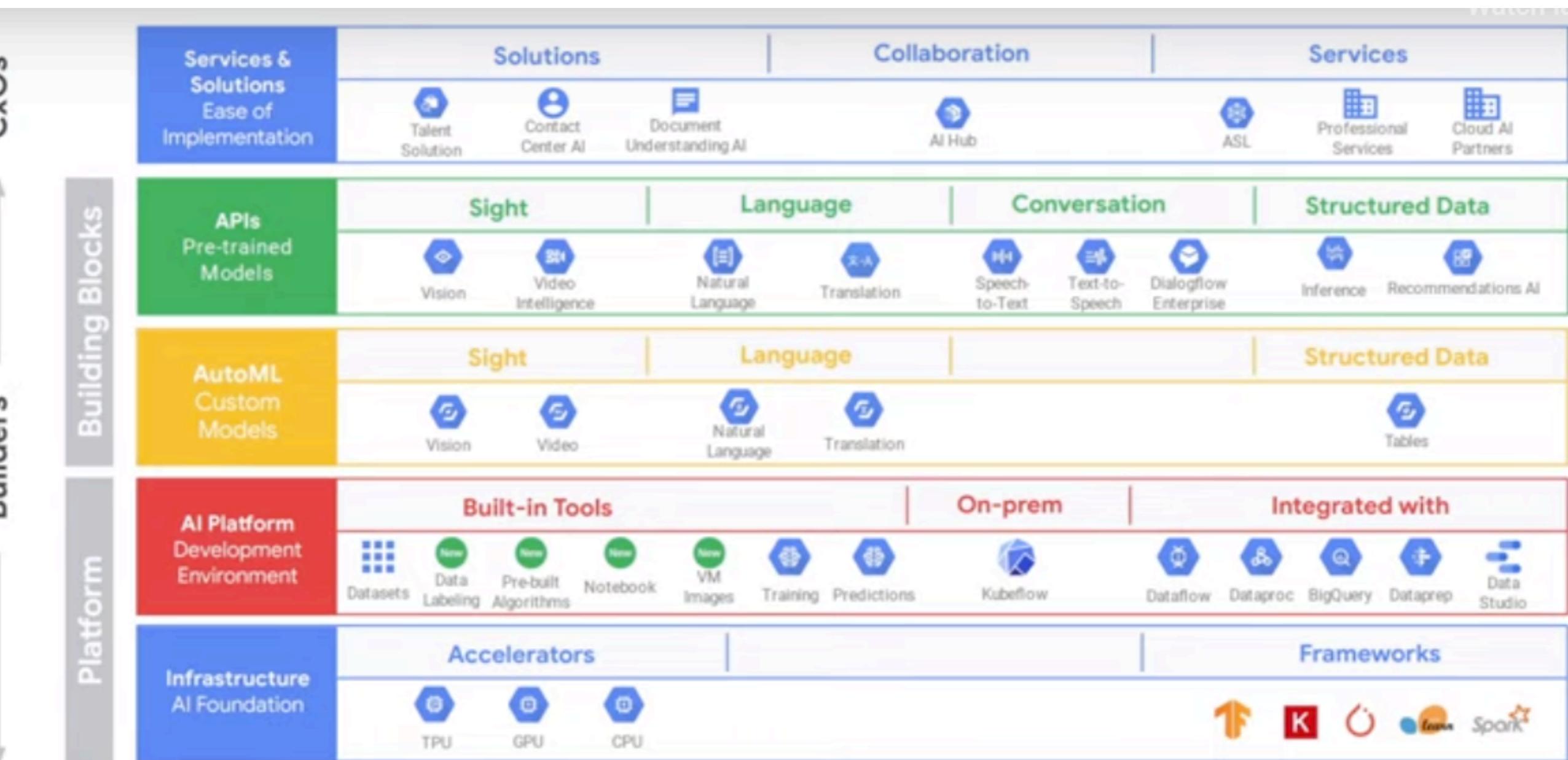
### ML SERVICES

 Amazon SageMaker	Ground Truth data labeling	ML Marketplace	SageMaker Studio IDE <small>NEW</small>						SageMaker Neo
			Built-in algorithms	SageMaker Notebooks <small>NEW</small>	SageMaker Experiments <small>NEW</small>	Model tuning	SageMaker Autopilot <small>NEW</small>	Model hosting	SageMaker Model Monitor <small>NEW</small>

### ML FRAMEWORKS & INFRASTRUCTURE

 TensorFlow <small>NEW</small>	 MXNet <small>NEW</small>	 PyTorch	 Gluon	 Keras	Deep Learning AMIs & Containers	GPUs & CPUs	Elastic Inference	Inferentia	FPGA
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# Google Cloud Platform



# Naver Cloud Platform

## AI Services

### Clova Speech Recognition(CSR)



Convert speech to text for various speech recognition purposes

[Learn More >](#)

### Clova Premium Voice(CPV)



With the advanced AI technology, Clova provides high-quality synthetic voices that sound as natural as real human voices.

[Learn More >](#)

### Papago NMT



Multilingual translation service based on the neural network algorithm

[Learn More >](#)

### TensorFlow Cluster



Use CLI to create an easy environment for the distributed parallel TensorFlow environment in cloud.

[Learn More >](#)

### Clova Speech Synthesis(CSS)



Convert text to natural language using a speech synthesis API

[Learn More >](#)

### Chatbot

Update



Easily create a Chatbot that understands users' intents to use for customer services.

[Learn More >](#)

### Papago Korean Name Romanizer



Convert Korean names according to the government-approved Romanization method

[Learn More >](#)

### Pose Estimation



Detects people in the image and get coordinate information on how many people are posing in the image.

[Learn More >](#)

### Clova Face Recognition(CFR)



Facial recognition using an image for various applications

[Learn More >](#)

### OCR

Update



A technology that automatically extracts text and images from printouts as digital data.

[Learn More >](#)

### TensorFlow Server



Server installed with TensorFlow, the main deep-learning framework and machine learning package (Optional GPU) provided for your convenience.

[Learn More >](#)

### Object Detection



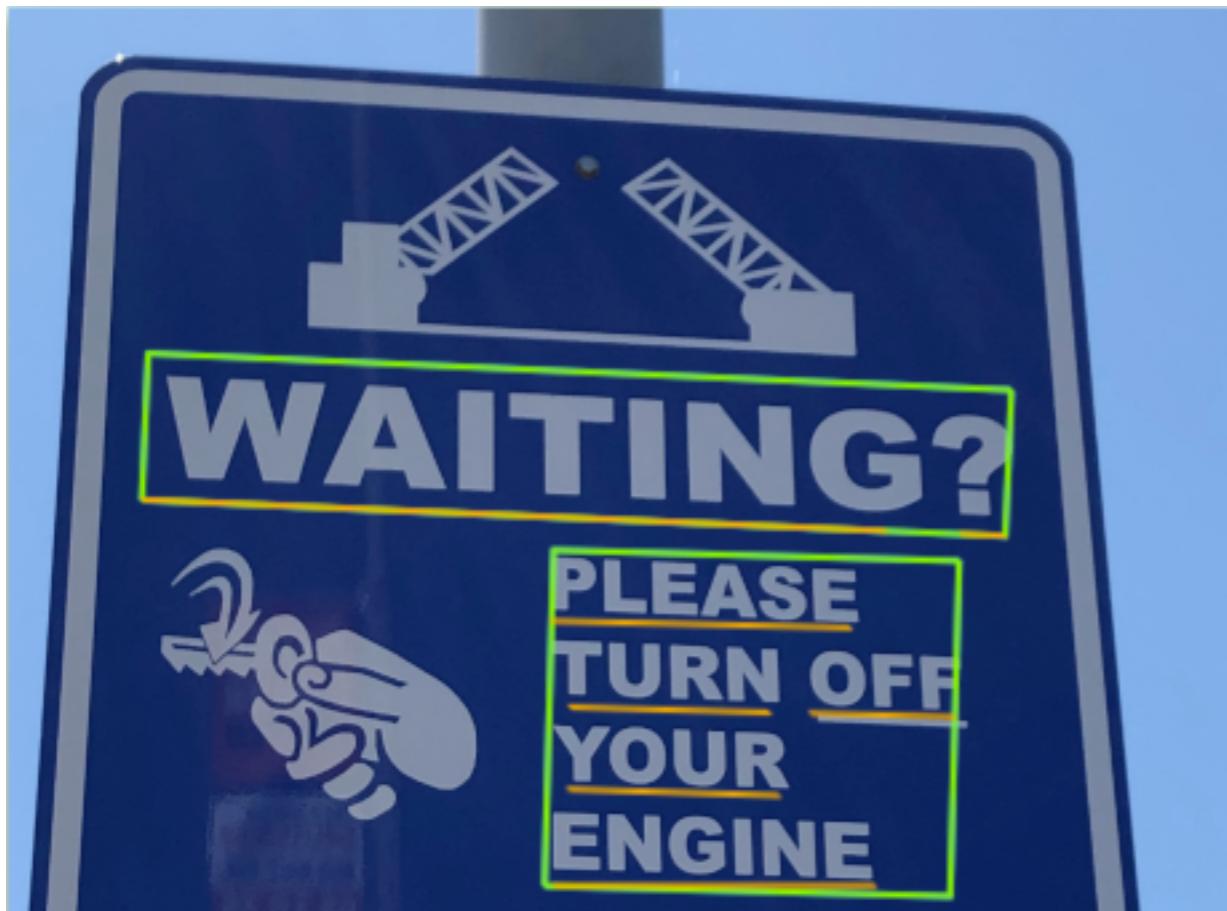
Detects the type and location of objects (e.g. people, cars, etc.) in the image and provides the information.

[Learn More >](#)

# Low-level AI service 종류

- Vision
  - OCR: 이미지에서 문자 인식
  - Face recognition: 얼굴 인식
  - Pose estimation: 동작 인식
  - Object Detection: 이미지내 객체 인식
- Text
  - Translation: 번역
  - Sentiment analysis: 감성분석
  - Entity analysis: 문장내 성분 분석
  - Keyword extraction: 키워드 추출
- Speech
  - STT: 음성을 문자로 변환
  - TTS: 문자를 음성으로 변환

# OCR: Optical Character Recognition



**Essential Tools for Cloud Platform**

Google Cloud SDK is a set of libraries and tools that you can use to manage computing resources and applications hosted on Google Cloud Platform. With the Cloud SDK you have access to the command-line interface, the Cloud Shell, and the Cloud API Client Library. The Cloud SDK also includes libraries for the Google Cloud APIs available in your language's package manager like Maven, npm and NuGet.

[View Cloud SDK](#)

**Simplify Your Cloud Management**

Cloud Deployment Manager allows you to specify all the resources needed for your application in a declarative format using yaml. You can use python or Java2 templates to parameterize the configuration and allow reuse of common deployment patterns such as a load-balanced, auto-scaled instance group. Test your configuration in code and perform repeatable deployments.

[View DEPLOYMENT MANAGER](#)

**Collaborative Development on Git**

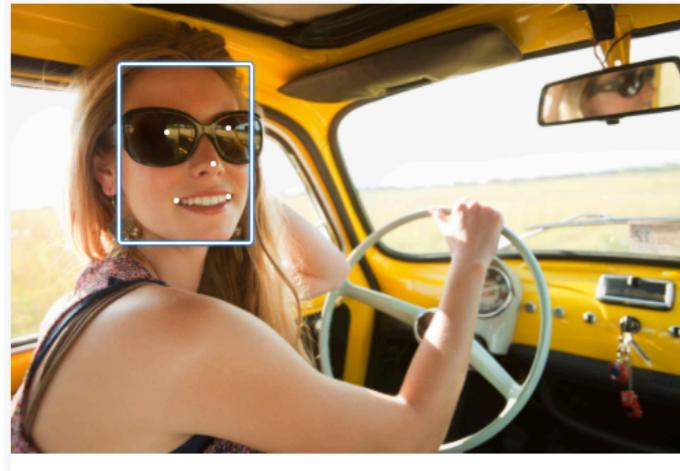
Cloud Source Repositories are private Git repositories hosted on the Cloud Platform. You can use Cloud Source Repositories for collaborative development between members of your team, or connect them directly to Google Cloud for continuous delivery of Cloud Apps. You can also connect your Cloud Source Repositories to GitHub, Jenkins, Travis CI, or Bitbucket. Connected repositories are synced automatically in both directions.

[View SOURCE REPOSITORIES](#)

# Face Recognition

## 얼굴 분석

신뢰도 점수를 포함하여 얼굴 속성을 완전히 분석합니다.



샘플 이미지 선택



[Read feature documentation to learn more](#)

Issues or questions? Use feedback button on bottom-left.

▼ 결과



looks like a face 99.9 %

appears to be female 99.3 %

age range 21 - 33 years old

smiling 92.2 %

appears to be happy 97.6 %

wearing glasses 99.9 %

자신만의 고유 이미지 사용

이미지는 .jpeg 또는 .png 형식이어야 하며 5MB 이하여야 합니다. 이미지가 저정되지 않았습니다.

업로드

또는 끌어서 놓기

이미지 URL 사용

이동

## 유명 인사 인식

Rekognition은 이미지에 있는 유명 인사를 자동으로 인식하고 신뢰도 점수를 제공합니다.



[Read feature documentation to learn more](#)

Issues or questions? Use feedback button on bottom-left.

▼ 결과



Jeff Bezos  
자세히 알아보기

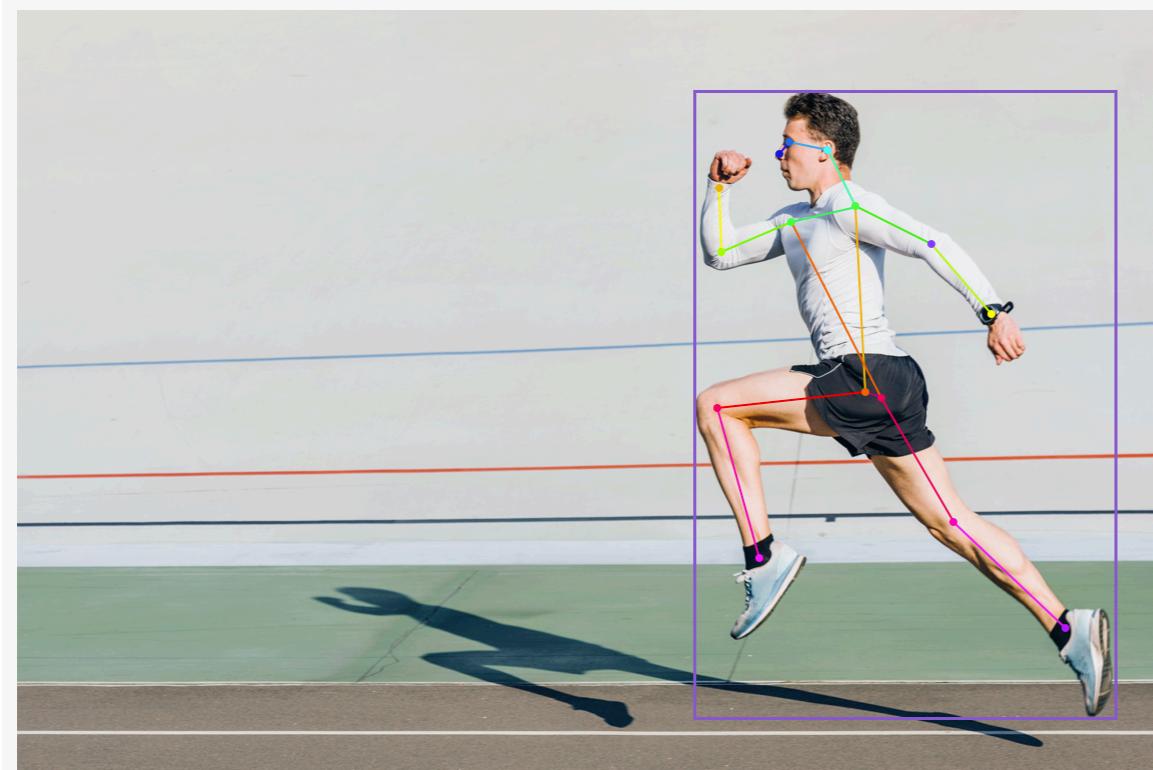
매칭 신뢰도

100 %

▶ 요청

▶ 응답

# Pose Estimation



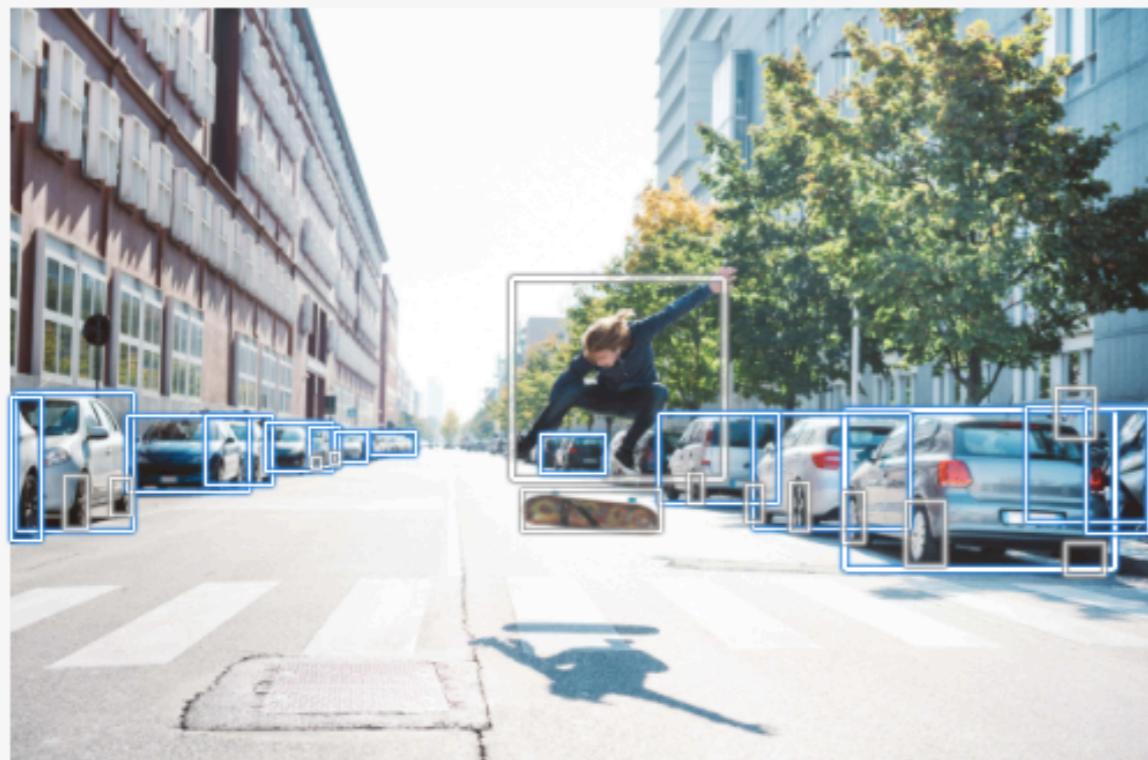
<https://developers.kakao.com/docs/latest/ko/pose/dev-guide>

[https://docs.ncloud.com/ko/ncpopenapi/pose\\_estimation.html](https://docs.ncloud.com/ko/ncpopenapi/pose_estimation.html)

# Object Detection

## 객체 및 장면 감지

Rekognition은 이미지에 있는 피사체, 개념, 장면에 자동으로 레이블을 지정하고 신뢰도 점수를 제공합니다.



샘플 이미지 선택



자신만의 고유 이미지 사용

이미지는 .jpeg 또는 .png 형식이어야 하며 5MB 이하여야 합니다. 이미지가 저장되지 않았습니다.

▲ 업로드

[Read feature documentation to learn more](#)

Issues or questions? Use feedback button on bottom-left.

### ▼ 결과

Vehicle	98.8 %
Transportation	98.8 %
Automobile	98.8 %
Car	98.8 %
Human	98.3 %
Person	98.3 %

# Entity Analysis

## Analyzed text

신미양요(1871년) 때 군함에 승선해 미국에 떨어진 한 소년이 미국 군인 신분으로 자신을 버린 조국인 조선으로 돌아와 주둔하며 벌어지는 일을 그린 드라마

## ▼ Results

Search		<	1	>	⚙️
Entity	Category	Confidence			▼
신미양요	Event	0.72			
1871년	Date	0.99+			
미국	Organization	0.89			
미국	Other	0.93			
조선	Location	0.74			

# Text-to-Speech

음성을 듣고 수정 및 다운로드하십시오. 준비가 되면 통합해 보십시오.

입력창에 텍스트를 입력하거나 붙여 넣고, 언어와 리전을 선택하고 원하는 음성을 선택합니다. [음성 듣기]를 클릭하고 원하는 애플리케이션과 서비스에 통합합니다.

최대 3,000자를 이용해 즉시 청취, 다운로드 또는 저장할 수 있습니다. 최대 100,000자까지 작업을 S3 버킷에 저장해야 합니다.

The screenshot shows the AWS Polly interface for generating speech from text. At the top, there are tabs for '일반 텍스트' (General Text) and 'SSML'. Below the tabs is a text input area containing the Korean text: '안녕하세요? 제 이름은 서연이에요. 여기에 텍스트를 입력하시면 제가 읽겠습니다.' (Hello? My name is Seoyeon. If you enter text here, I will read it for you.) To the right of the text input is a small green circular icon with a white letter 'G'. At the bottom of the input area, it says '44 문자 사용' (44 characters used). To the right of the text input are two buttons: '기본 텍스트 표시' (Show basic text) and '텍스트 지우기' (Delete text). Below the text input area, there are two sections: '언어 및 리전' (Language and Region) and '음성' (Voice). Under '언어 및 리전', a dropdown menu is set to '한국어' (Korean). Under '음성', a radio button is selected for 'Seoyeon, 여성' (Seoyeon, Female). At the bottom left is a blue button with a white triangle icon and the text '▶ 음성 듣기' (Listen to voice).

# Speech-to-text



<https://www.youtube.com/watch?v=GILvyiWB7xY>

<https://youtu.be/V5aZjsWM2wo?t=1811>

# High-level AI service 종류

- 추천시스템 (Recommender systems)
- 시계열 예측 (Forecast)
- 개인화 (Personalize)
- 사기탐지 (Fraud detection)
- 검색엔진 (Search engine)
- 챗봇 (Chatbot)

# API란?

- Application Programming Interface
  - 응용 프로그램 프로그래밍 인터페이스
- 소프트웨어 간 상호작용을 위한 매개체
- API의 종류
  - Private API
  - Public API: 외부에 허가된 모든 사용자가 접근 및 사용 할 수 있는 API
- 다양한 형태가 있지만, 일반적으로 REST형태로 제공되는 API가 많음

# API 활용

- API 예

Request: 이미지 URL로 요청

```
curl -v -X POST "https://dapi.kakao.com/v2/vision/face/detect" \
-d "image_url=https://t1.daumcdn.net/alvolo/_vision/openapi/r2/images/01.jpg" \
-H "Authorization: KakaoAK {REST_API_KEY}"
```

Request: 이미지로 요청

```
curl -v -X POST "https://dapi.kakao.com/v2/vision/face/detect" \
-F "image=@sample_face.jpg" \
-H "Authorization: KakaoAK kkkkkkkkkkkkkkkkkkkkkkkkkkkkk"
```

# SDK란?

- Software Development Kit
  - API 호출을 패키지화한 라이브러리
  - 각 서비스 별 Python SDK 찾아 설치 후 사용

```
# Imports the Google Cloud client library
from google.cloud import vision
from google.cloud.vision import types

# Instantiates a client
client = vision.ImageAnnotatorClient()

# The name of the image file to annotate
file_name = os.path.abspath('resources/wakeupcat.jpg')

# Loads the image into memory
with io.open(file_name, 'rb') as image_file:
    content = image_file.read()

image = types.Image(content=content)

# Performs label detection on the image file
response = client.label_detection(image=image)
labels = response.label_annotations

print('Labels:')
for label in labels:
    print(label.description)
```

**E.O.D**