



# Building Smart Applications with Amazon AI

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# Our mission

**Put Machine Learning in the hands of every  
developer**

# More ML is built on AWS than anywhere else



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# The AWS ML Stack

## **Application Services**

API-driven services: Vision, Language & Speech Services, Chatbots

## **Platform Services**

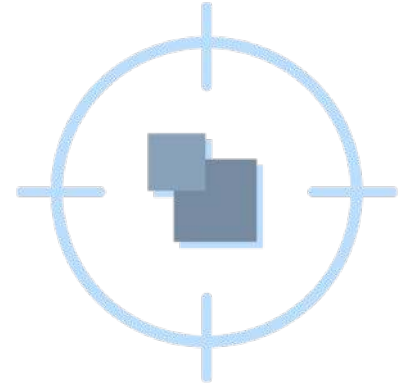
Deploy machine learning models with high-performance machine learning algorithms, broad framework support, and one-click training, tuning, and inference.

## **Frameworks & Infrastructure**

Develop sophisticated models with any framework, create managed, auto-scaling clusters of GPUs for large scale training, or run prediction on trained models.

# Amazon Rekognition

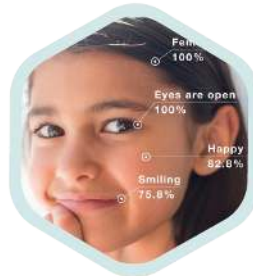
Deep Learning-based image analysis service



# Amazon Rekognition Image



## Object and Scene Detection



## Facial Analysis



# Face Recognition



# Unsafe Image Detection



## Celebrity Recognition



Text in Image



## Face Comparison

# Object & Scene Detection



|            |       |
|------------|-------|
| City       | 91.4% |
| Downtown   | 91.4% |
| Metropolis | 91.4% |
| Urban      | 91.4% |
| Building   | 56.2% |
| High Rise  | 56.2% |
| Dock       | 55.6% |
| Pier       | 55.6% |
| Dawn       | 52.4% |
| Dusk       | 52.4% |



# Facial Analysis



|                      |                   |
|----------------------|-------------------|
| looks like a face    | 99.8%             |
| appears to be female | 100%              |
| age range            | 23 - 38 years old |
| smiling              | 99.4%             |
| appears to be happy  | 93.2%             |
| wearing eyeglasses   | 99.9%             |
| wearing sunglasses   | 97.6%             |

# Crowd Detection – up to 100 faces



# Facial Search



=



Similarity

97%



≠



≠



# Image Moderation



## ▼ Results

|                              |       |
|------------------------------|-------|
| Suggestive                   | 83.5% |
| Female Swimwear Or Underwear | 83.5% |

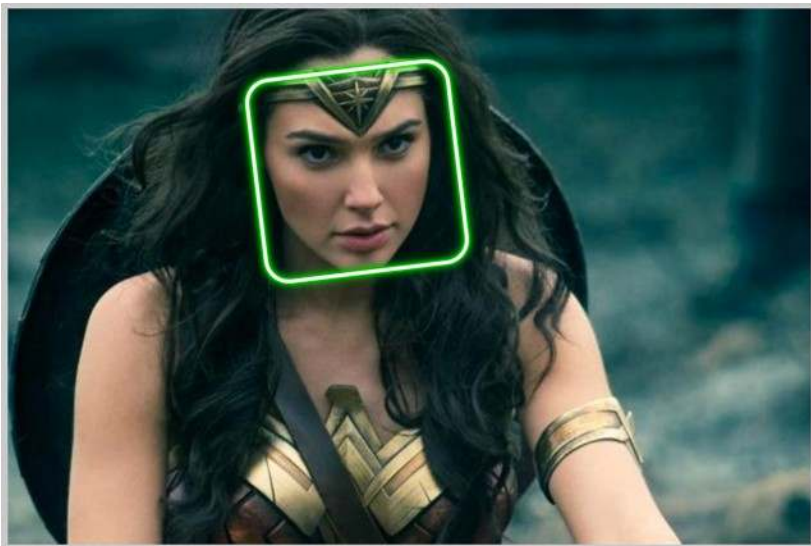
### Explicit Nudity

- Nudity
- Graphic Male Nudity
- Graphic Female Nudity
- Sexual Activity
- Partial Nudity

### Suggestive

- Female Swimwear or Underwear
- Male Swimwear or Underwear
- Revealing Clothes

# Celebrity Recognition



## ▼ Results



**Gal Gadot**  
[Learn More](#)

Match confidence

100%

# Text in Image



## ▼ Results

US English only

| 5T6E652 |

## ► Request

## ▼ Response

```
{
  "TextDetections": [
    {
      "Confidence": 96.38984680175781,
      "DetectedText": "5T6E652",
      "Geometry": {
        "BoundingBox": {
          "Height": 0.05606506019830704,
          "Left": 0.38905566930770874,
          "Top": 0.7383729219436646,
          "Width": 0.10844030976295471
        },
        "Polygon": [
          {
            "X": 0.38905566930770874,
            "Y": 0.7383729219436646
          },
          {
            "X": 0.49749597907066345,
            "Y": 0.7726403474807739
          },
          {
            "X": 0.4896218776702881,
            "Y": 0.8287054300308228
          },
          {
            "X": 0.38905566930770874,
            "Y": 0.7383729219436646
          }
        ]
      }
    }
  ]
}
```



# Marinus Analytics

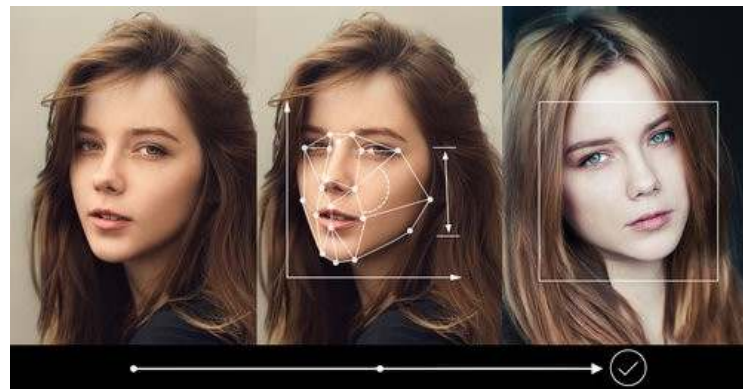


Marinus Analytics provides law enforcement with tools founded in artificial intelligence.

Traffic Jam, is a suite of tools for use by law enforcement agencies on sex trafficking investigations.

Before using **Amazon Rekognition**, their only recourse was manual processing; this was time-intensive or not possible.

Now, investigators are able to take effective action by searching through **millions of records in seconds** to find victims.



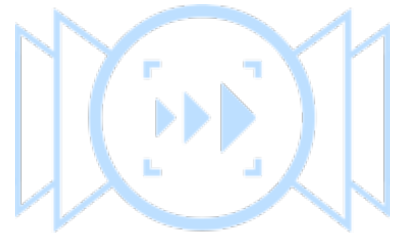
<http://www.marinusanalytics.com/articles/2017/10/17/amazon-rekognition-helps-marinus-analytics-fight-human-trafficking>

# DEMO



# Amazon Rekognition Video

Deep Learning-based video analysis service



# Amazon Rekognition Video

Analyze activity, recognize, and track people in stored and live video



Object and activity  
detection



Person tracking



Real-time  
live stream



Celebrity  
recognition



Unsafe video  
detection



Face recognition



Facial  
Analysis



## THE ROYAL WEDDING



## ARRIVALS



**Elton John**  
Singer



**David Furnish**  
Elton John's husband



**David Beckham**  
Former footballer



**Victoria Beckham**  
Businesswoman



**Princess Beatrice**  
Royal Family



**Princess Eugenie**  
Royal Family



**Prince Seeiso Bereng**  
Royal Family of Lesotho



**Princess Mabereng Seeiso**  
Royal Family of Lesotho

## PROFILES



**David Beckham** Former footballer

David Robert Joseph Beckham, OBE is an English former professional footballer. He played for Manchester United, Preston North End, Real Madrid, Milan, LA Galaxy.

Now playing...

Sky News used **Amazon Rekognition** to perform **real-time identification of guests** as they enter St. George's Chapel

# Traffic Cam 352 - Riverview West

Northbound

03:15:05:41

Mon, Nov 27, 2017



**LIVE STREAMING** ●

*Front Door Camera 1*

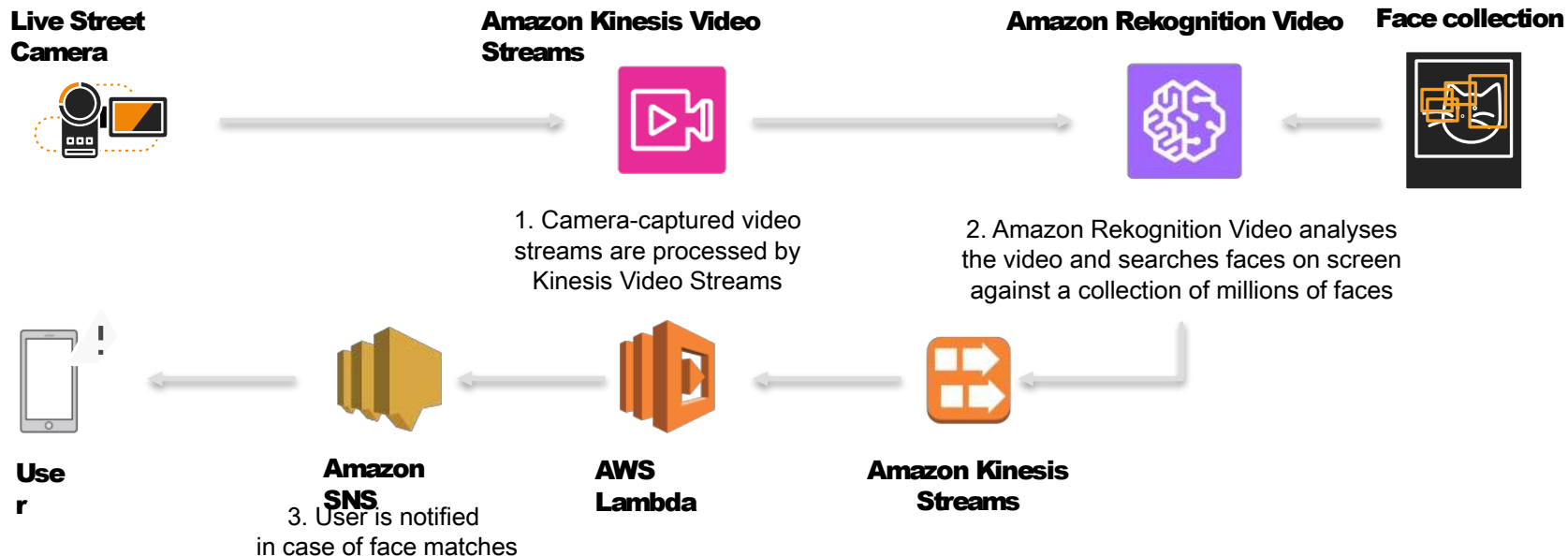


Smartphone Video

00:05:00



# Use case: real-time video identification



# DEMO

<https://aws.amazon.com/blogs/machine-learning/easily-perform-facial-analysis-on-live-feeds-by-creating-a-serverless-video-analytics-environment-with-amazon-rekognition-video-and-amazon-kinesis-video-streams>



# Amazon Polly

Deep Learning-based text-to-speech service



# Amazon Polly

Turn text into lifelike speech using Deep Learning



Wide selection of  
voices and languages



Synchronize



Fine-grained  
control



replay

# A Focus on Voice Quality

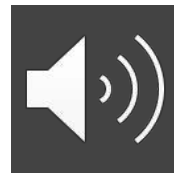
Support for Speech Synthesis Markup Language (SSML) Version 1.0

<https://www.w3.org/TR/speech-synthesis>

<speaking xml:lang="en-US">

The price of this book is <prosody rate="60%">45€</prosody>

</speaking>



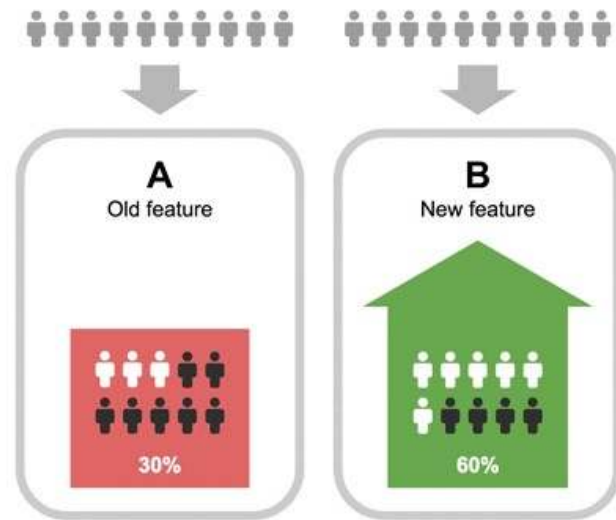
# Duolingo



Duolingo is the most popular language-learning platform and the most downloaded education app in the world, with more than **170 million users**.

They have run six A/B tests, testing an **Amazon Polly** voice against a voice from other TTS providers.

For all of these experiments, the winning condition was the Amazon Polly voice



<https://aws.amazon.com/blogs/machine-learning/powering-language-learning-on-duolingo-with-amazon-polly/>

# DEMO

# Amazon Translate

Neural Machine Translation Service

**Now generally available**



FREE TIER

# Amazon Translate

Natural and fluent language translation



Real-time  
translation



Batch analysis



Automatic language  
recognition



Low cost

# Languages

## Available now

English to/from:

- Spanish
- Portuguese
- German
- French
- Arabic
- Simplified Chinese

## Coming soon

- Japanese
- Russian
- Italian
- Traditional Chinese
- Turkish
- Czech



# DEMO

# Amazon Transcribe

Automatic speech recognition service

**Now generally available**



FREE TIER

# Amazon Transcribe

Automatic conversion of speech into accurate, grammatically correct text



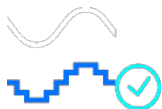
Multiple  
languages



Intelligent punctuation  
and formatting



Timestamp  
generation



Support for  
telephony audio



Recognize multiple  
speakers

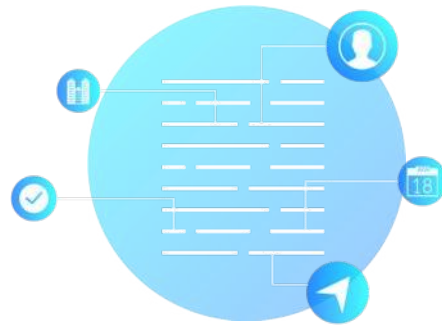


Custom  
vocabulary

# DEMO

# Amazon Comprehend

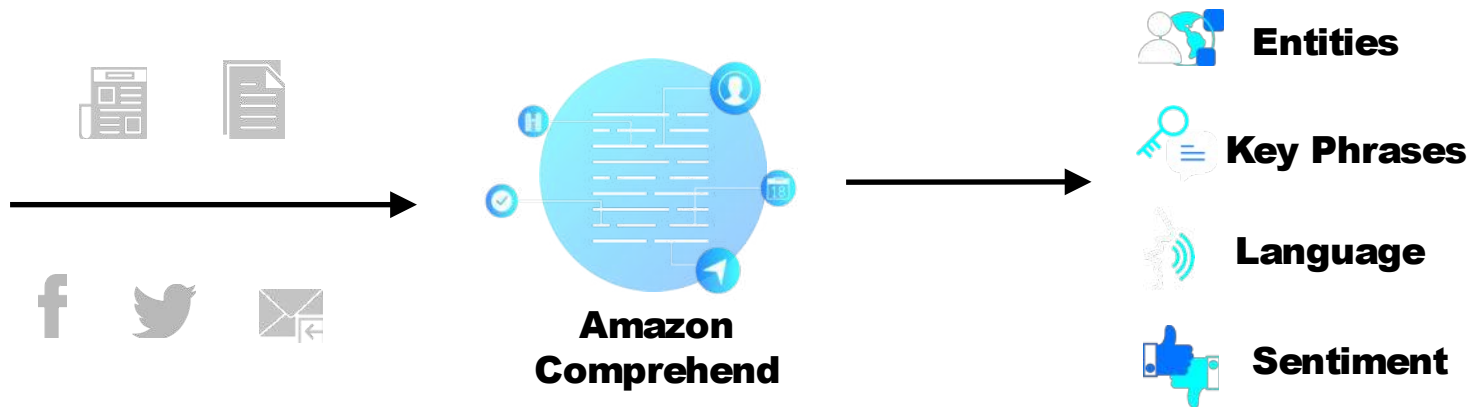
Natural Language Processing



FREE TIER

# Fully managed natural language processing

Discover valuable insights from text



# Topic modeling



**Amazon  
Comprehend**

STORM



WORLD  
SERIES



STOCK  
MARKET



WASHINGTON



AUSTRALIA HEALTH



CRISIS



MACHINE  
LEARNING



# **DEMO**

**Rekognition + Polly  
+ Comprehend + Translate**



# Democratization of ML

## APPLICATION SERVICES



**Amazon  
Rekognition**



**Amazon  
Polly**



**Amazon  
Lex**

**Amazon  
Comprehend**



**Amazon  
Rekognition  
Video**

**Amazon  
Transcribe**

**Amazon  
Translate**

## PLATFORM SERVICES

**Amazon  
SageMaker**

**AWS DeepLens**

**Amazon EMR**

## FRAMEWORKS AND INTERFACES

**Deep  
Learning AMI**

Apache  
MXNet

Caffe2

CNTK

PyTorch

TensorFlow

Theano

Torch

Keras

Gluon

# Thank you!



<https://aws.amazon.com/machine-learning>

<https://aws.amazon.com/blogs/ai>

<https://medium.com/@julsimon>

<https://youtube.com/juliensimonfr>

<https://gitlab.com/juliensimon/aws>

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