aws

DEV DAY

Machine Learning on AWS

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@julsimon

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A Long History of ML at Amazon

Personalized recommendations

Fulfillment automation and inventory management

Drones

Voice driven interactions

Inventing entirely new customer experiences

Our mission

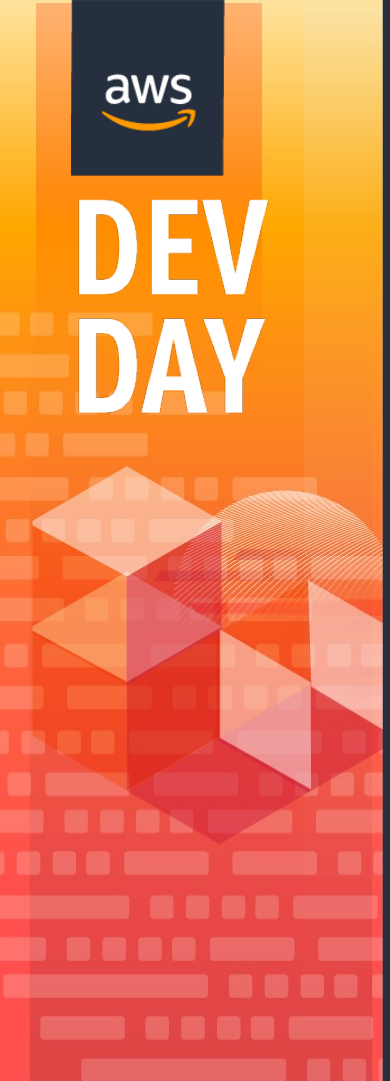
Put Machine Learning in the hands
of every developer and data scientist

More ML is built on AWS than anywhere else

More ML is built on AWS than anywhere else

AWS ML Stack

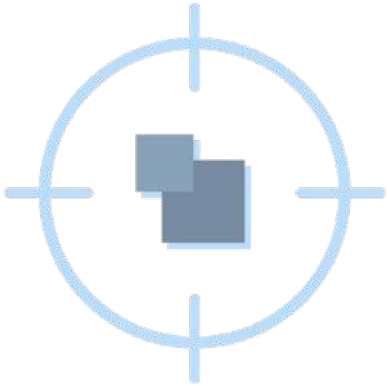
Application Services	API-driven services: Vision, Language & Speech Services, Chatbots
Platform Services	Deploy machine learning models with high-performance machine learning algorithms, broad framework support, and one-click training, tuning, and inference.
Frameworks & Infrastructure	Develop sophisticated models with any framework, create managed, auto-scaling clusters of GPUs for large scale training, or run prediction on trained models.



Application Services

Amazon Rekognition

Deep Learning-based image analysis service



FREE TIER

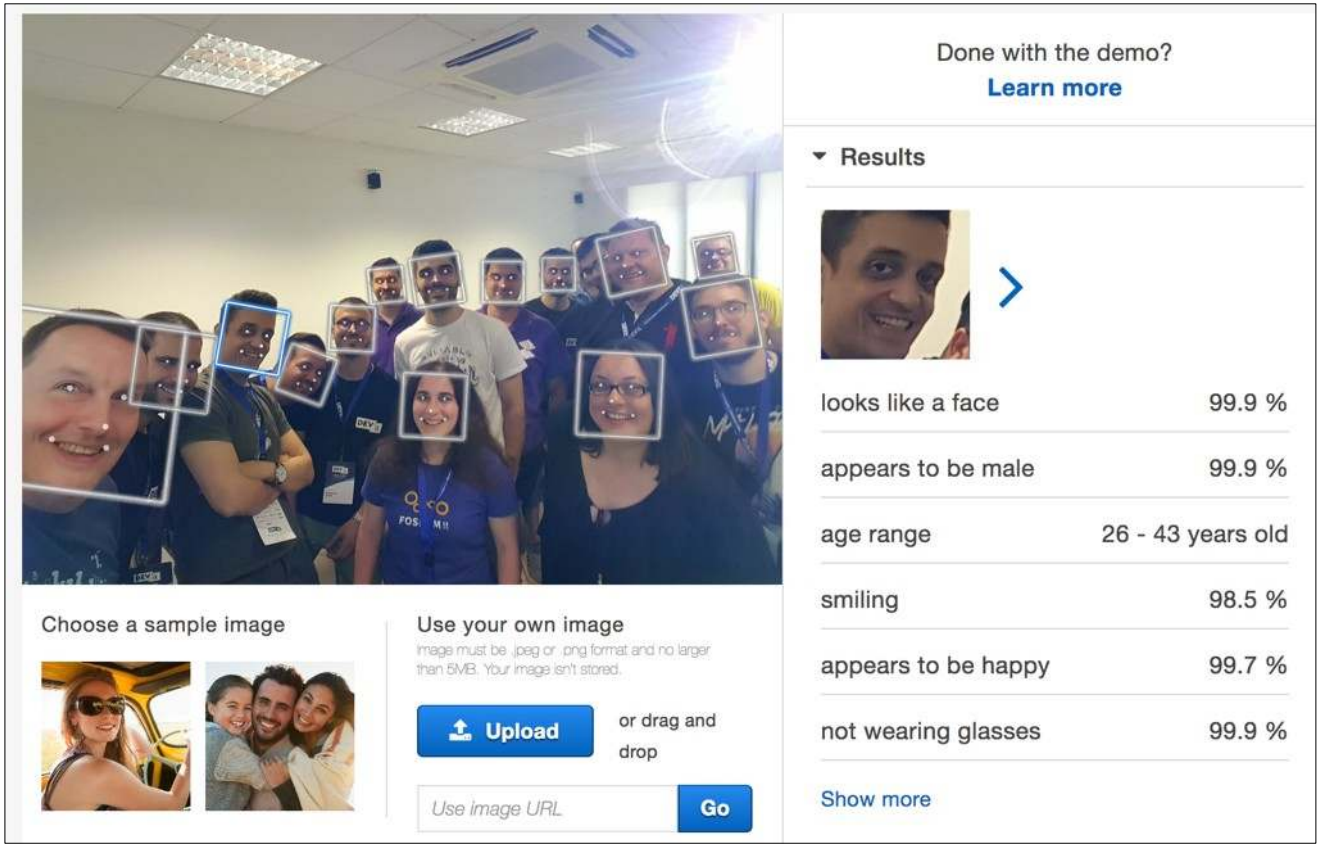
Object & Scene Detection

Culinary	99,8 %
Food	99,8 %
Human	99,5 %
Person	99,5 %
Indoors	65,9 %
Room	56,6 %
Chef	56,1 %

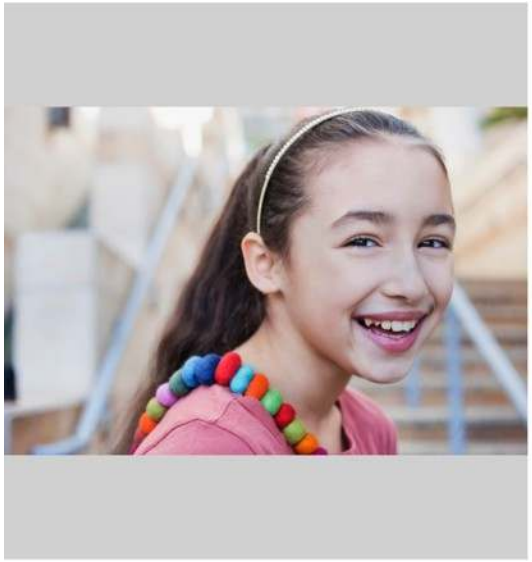
Facial Analysis

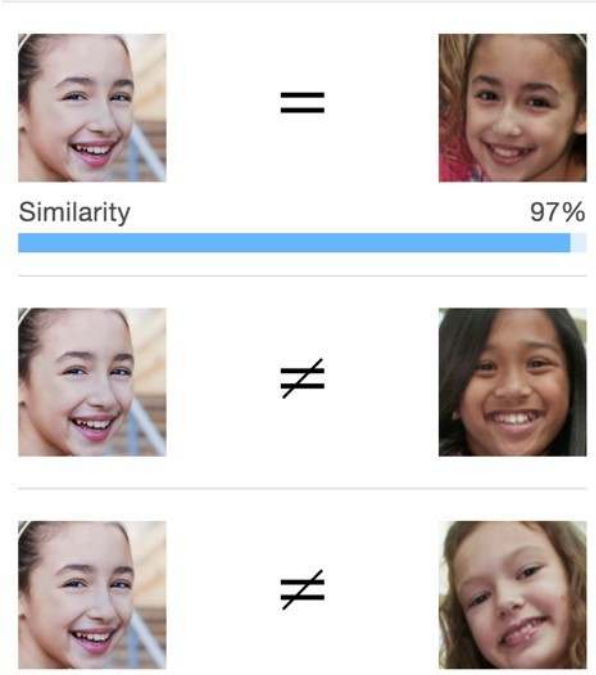
looks like a face	99.8%
appears to be female	100%
age range	23 - 38 years old
smiling	99.4%
appears to be happy	93.2%
wearing eyeglasses	99.9%
wearing sunglasses	97.6%

Crowd Detection – up to 100 faces



Facial Search



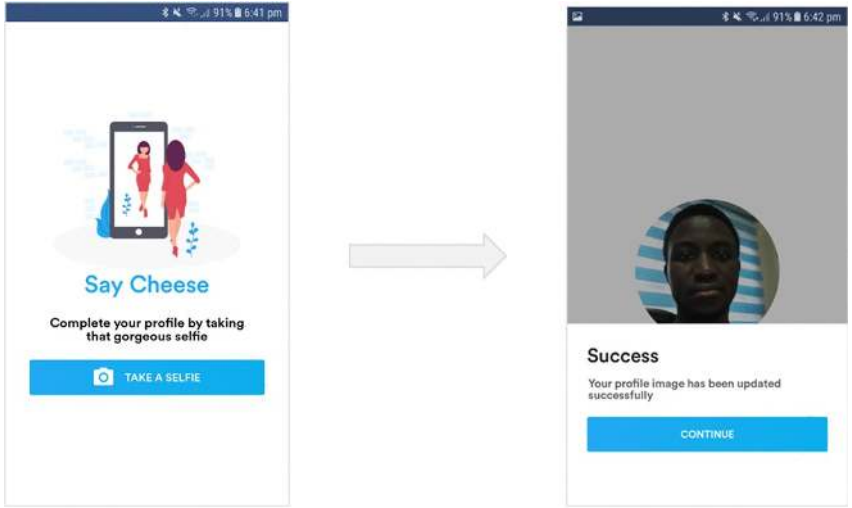


Aella Credit

Aella Credit is a financial services company based in West Africa that provides instant loans to individuals by using biometric and employer data.

In emerging markets, identity verification and validation is a major challenge for people who don't have easy access to retail banking services.

Aella Credit uses Amazon Rekognition, for biometric identity verification on their mobile application.



https://aws.amazon.com/blogs/machine-learning/aella-credit-empowers-underbanked-individuals-by-using-amazon-rekognition-for-identity-verification/

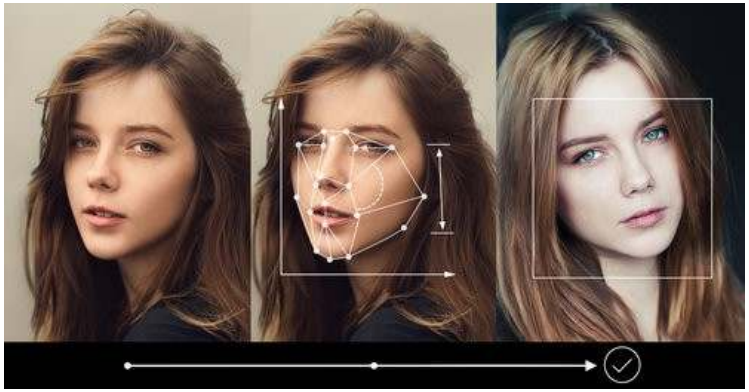
Marinus Analytics

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

Image Moderation

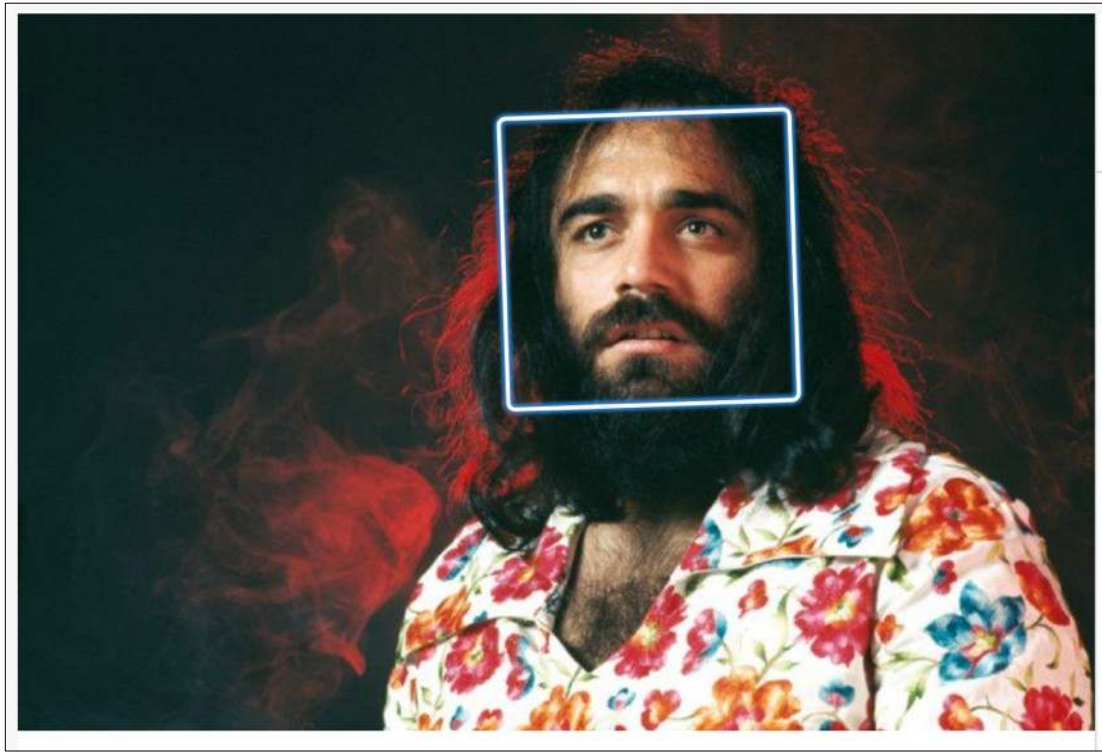
Results

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



Done with the demo?

Learn more

▼ Results

Demis Roussos

Learn More

Match confidence 99 %

▶ Request

▶ Response

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
               },
               {
```

Amazon Rekognition Video

Deep Learning-based video analysis service

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Video Analysis

Video

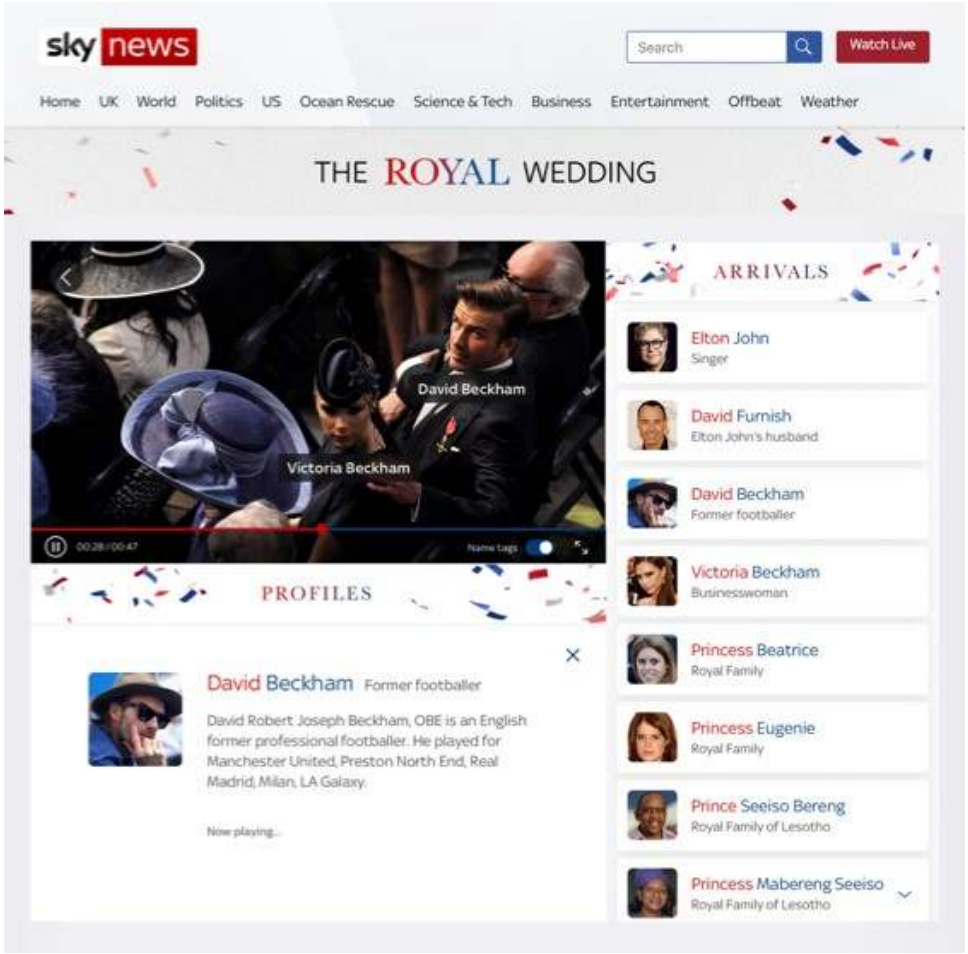
Rekognition

Context

- Spatial
- Temporal
- Auditory

Features

- Objects, Scenes and Concepts
  - Person: 98.9%
  - Plant: 91.4%
  - Sports: 60.0%
  - 0:00 – 0:27
- Facial Analysis
  - Female: 99.9%
  - Eyes are open: 98.4%
  - Calm: 86.0%
- Face Recognition
  - Person 1
- Activity Detection
  - Sports, Running
- Object Tracking



sky NEWS

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

Amazon Polly

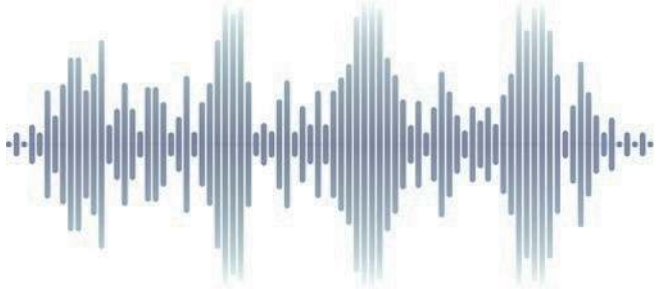
Deep Learning-based text-to-speech service

FREE TIER

Amazon Polly: Text In, Life-like Speech Out

"Salut, je m'appelle Léa. Je suis la nouvelle voix française de Polly."

Amazon Polly



57 voices across 28 languages.

A Focus On Voice Quality & Pronunciation

Support for Speech Synthesis Markup Language (SSML) Version 1.0
https://www.w3.org/TR/speech-synthesis

```
<speak xml:lang="en-US">
    The price of this book is <prosody rate="60%">45€</prosody>
</speak>
```

Breathing

https://aws.amazon.com/blogs/machine-learning/amazon-polly-releases-new-ssml-breath-feature/

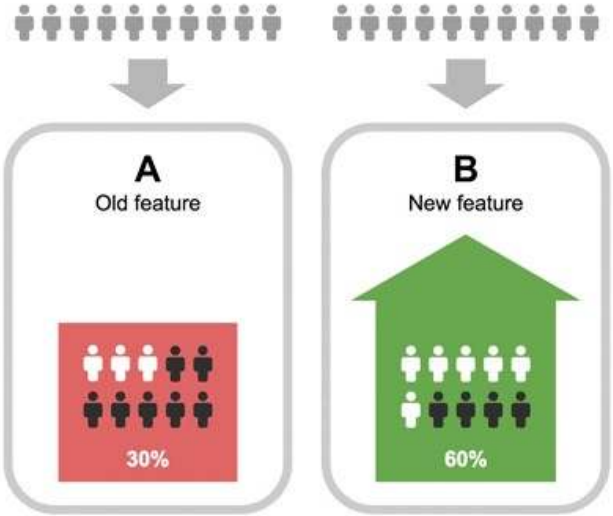
<amazon:auto-breaths>

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/

Amazon Translate

Neural Machine Translation Service

FREE TIER

Amazon Translate

Natural and fluent language translation

Real-time translation

Batch analysis

Automatic language recognition

Low cost

Languages

Arabic	Chinese (Simplified)	Chinese (Traditional)	Czech	Danish
Dutch	English	Finnish	French	German
Hebrew	Indonesian	Italian	Japanese	Korean
Polish	Portuguese	Russian	Spanish	Swedish
Turkish				

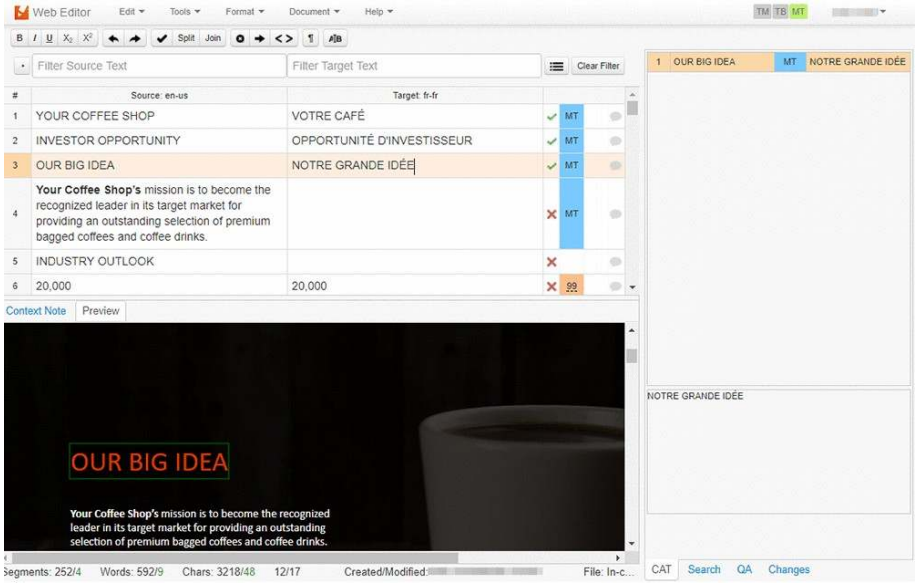
21 languages, 417 language pairs

Memsource

Memsource was founded in 2010 and has become a leader in cloud-based translation technology.

Memsource and Amazon Translate are connected via the Amazon Translate API.

Results are available in real-time from within the Memsource translation workbenches, Memsource Web Editor, and Desktop Editor.



https://aws.amazon.com/blogs/machine-learning/amazon-translate-now-available-in-the-memsource-translation-management-system/

Amazon Transcribe

Automatic speech recognition service

FREE TIER

Amazon Transcribe

Automatic conversion of speech into accurate, grammatically correct text

US English
US Spanish
Australian English
British English
French
Canadian French
Italian
Brazilian
Portuguese

8 languages

Intelligent punctuation and formatting

Timestamp generation

Support for telephony audio

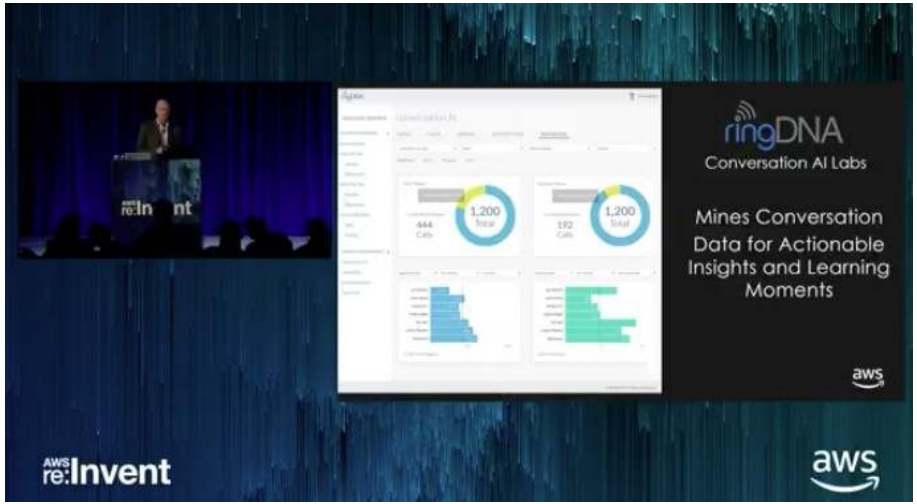
Recognize multiple speakers

Custom vocabulary

ringDNA

RingDNA is an end-to-end communications platform for sales teams.

Hundreds of enterprise organizations use RingDNA to increase productivity, engage in smarter sales conversations, gain predictive insights and improve their win rate.



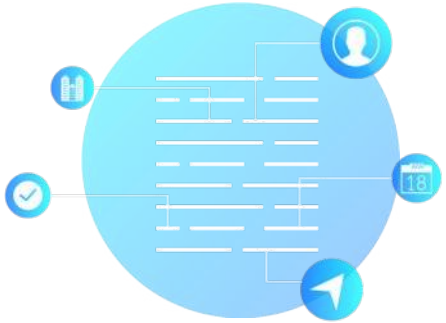
https://www.youtube.com/watch?v=1ZJ_f1bDdog

Speech to Text
"A critical component of RingDNA's Conversation AI requires best of breed speech-to-text to deliver transcriptions of every phone call. RingDNA is excited about Amazon Transcribe since it provides high-quality speech recognition at scale, helping us to better transcribe every call to text"

Howard Brown, CEO & Founder, RingDNA

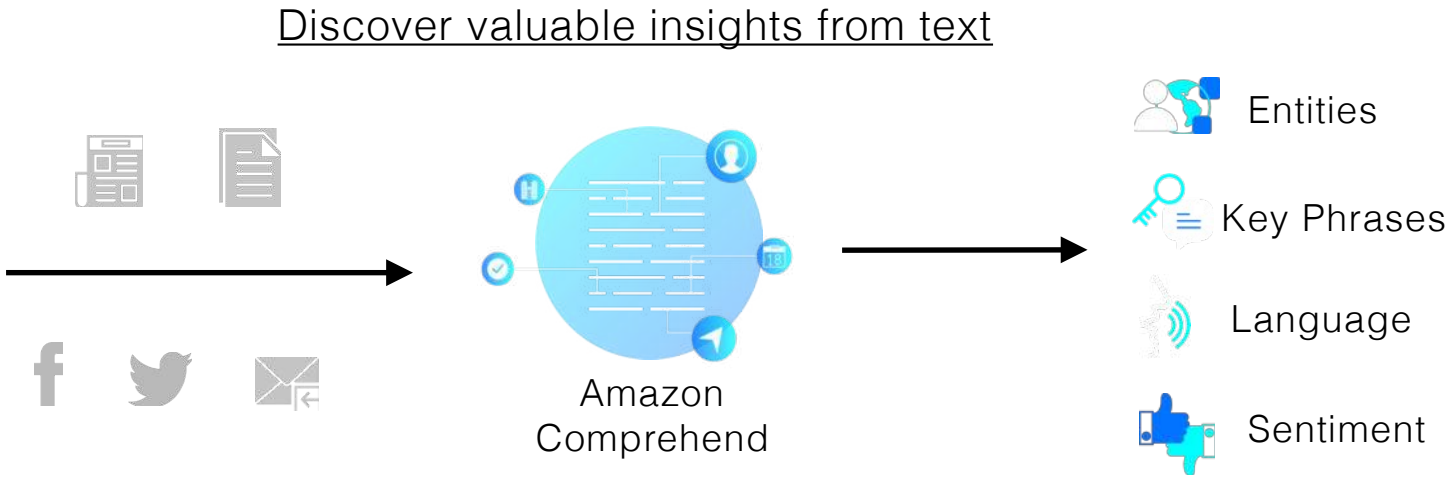
Amazon Comprehend

Natural Language Processing



FREE TIER

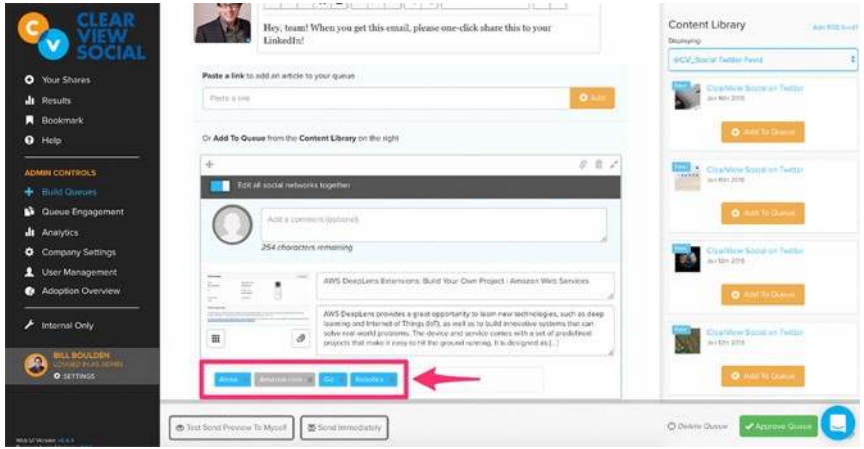
Fully managed natural language processing



ClearView Social

ClearView Social enables a company's employees to share approved content on LinkedIn, Twitter, and other social networks.

To eliminate the reliance on manual tagging, ClearView Social turned to Amazon Comprehend to find insights and relationships in text.

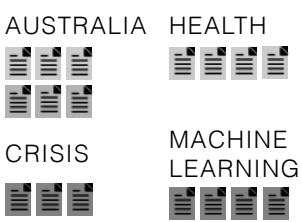


Natural Language Processing
"We use Amazon Comprehend to read an article and extract topics, which are automatically tagged using machine learning. This automatic tagging helps customers easily estimate the market value of their engagement according to the current bid prices from the Google AdWords API"
Bill Boulden, CTO, ClearView Social

https://aws.amazon.com/blogs/machine-learning/clearview-social-uses-amazon-comprehend-to-measure-the-impact-of-social-sharing/

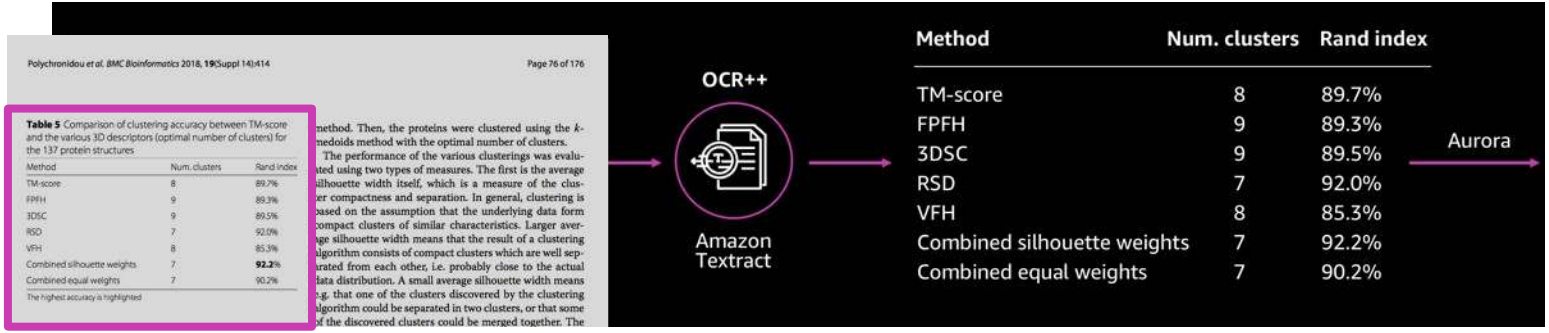
Topic modeling

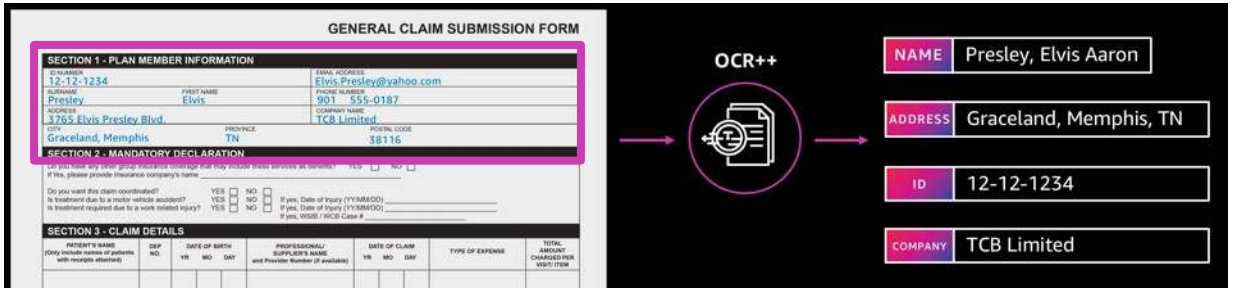
Amazon
Comprehend

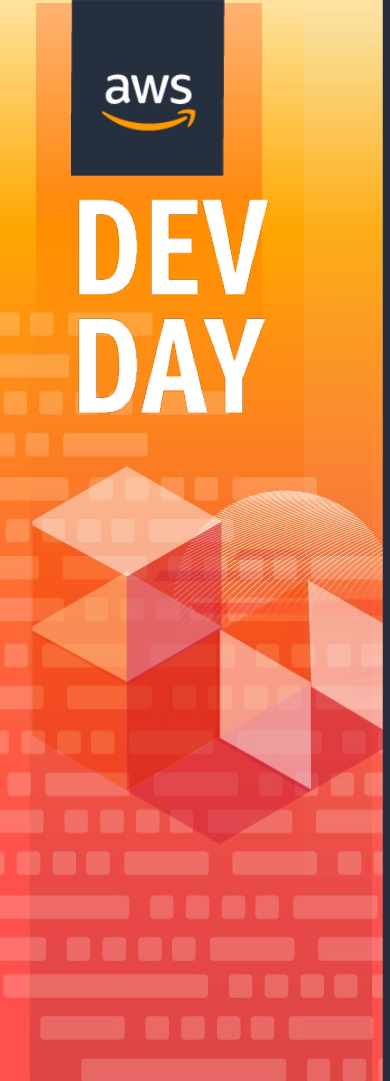


Amazon Textract (preview)

OCR++ service to easily extract text and data from virtually any document







Platform Services

Amazon SageMaker

Easily build, train, and deploy Machine Learning models

Collect and prepare training data

Choose and optimize your ML algorithm

Set up and manage environments for training

Train and tune model (trial and error)

Deploy model in production

Scale and manage the production environment

Amazon SageMaker

Pre-built notebooks for common problems

Built-in, high-performance algorithms

ALGORITHMS	K-Means Clustering Principal Component Analysis Neural Topic Modelling Factorization Machines Linear Learner	XGBoost Latent Dirichlet Allocation Image Classification Seq2Seq, And more!
FRAMEWORKS	Apache MXNet, Chainer TensorFlow, PyTorch	Caffe2, CNTK, Torch

Set up and manage environments for training

Train and tune model (trial and error)

Deploy model in production

Scale and manage the production environment

Build

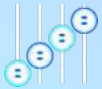
Amazon SageMaker

Pre-built notebooks for common problems

Built-in, high-performance algorithms

Build

One-click training



Hyperparameter optimization

Train

Deploy model in production

Scale and manage the production environment

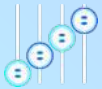
Amazon SageMaker

Pre-built notebooks for common problems

Built-in, high-performance algorithms

Build

One-click training



Hyperparameter optimization

Train

One-click deployment

Fully managed hosting with auto-scaling

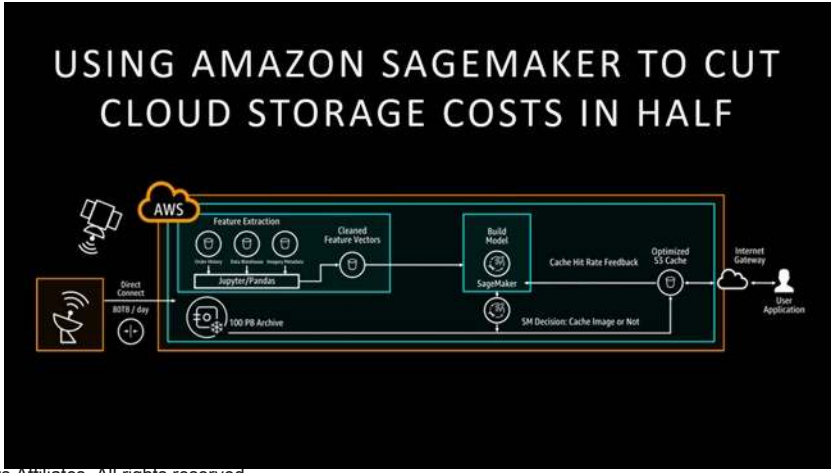
Deploy

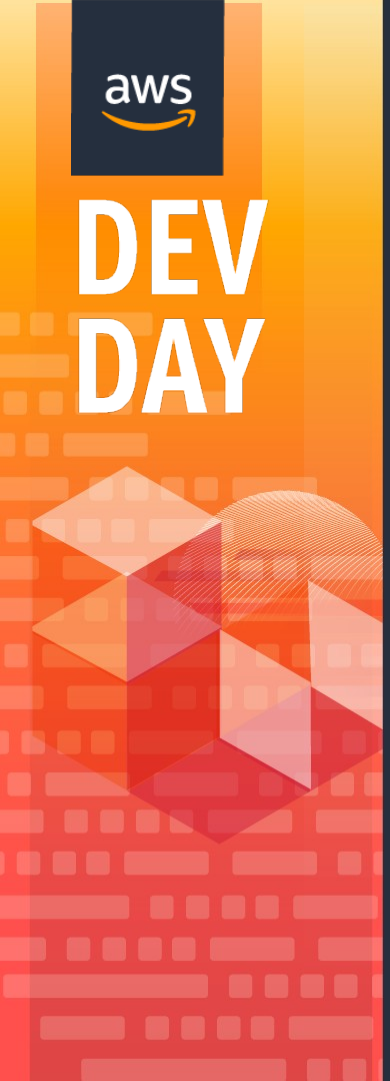
FREE TIER

Digital Globe

https://aws.amazon.com/solutions/case-studies/digitalglobe-machine-learning/

- Operating Earth imaging satellites and providing image analysis services.
- Over 100 PB of imagery.
- Extensive use of Machine Learning on SageMaker to extract information from images.
- Working with the AWS ML Lab, built a predictive model reducing cloud storage costs by 50%.





Thank you!

https://ml.aws
https://aws.amazon.com/blogs/machine-learning

https://medium.com/@julsimon
https://youtube.com/juliensimonfr

Julien Simon

Principal Technical Evangelist, AI and Machine Learning

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