AWS Rekognition

Rich Image Metadata Extraction Powered by Deep Learning

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Artificial neural network

Deep Learning Process

Conv 1

Conv 2

Conv n

Fully Connected Layer

Softmax

Probability

Labrador

Dog

Beach

Outdoors
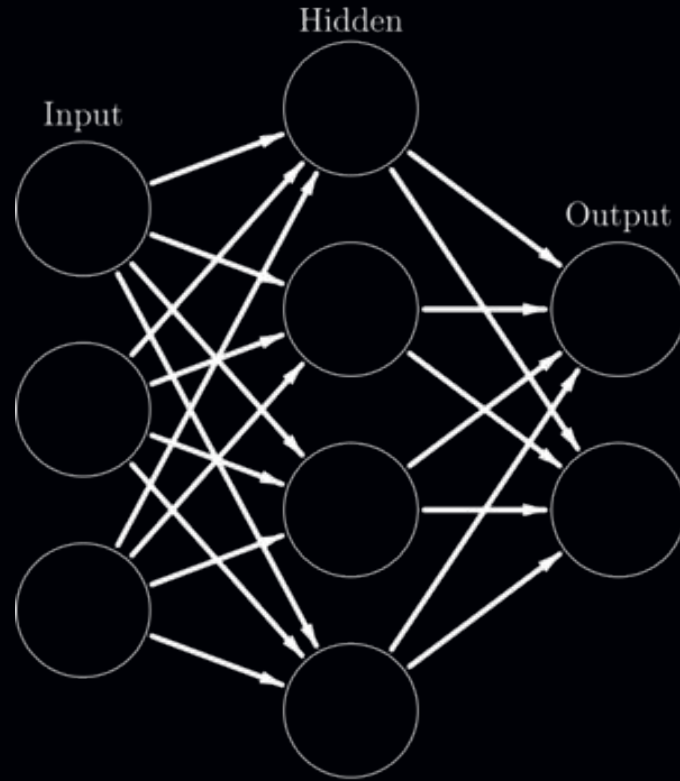
Feature Maps
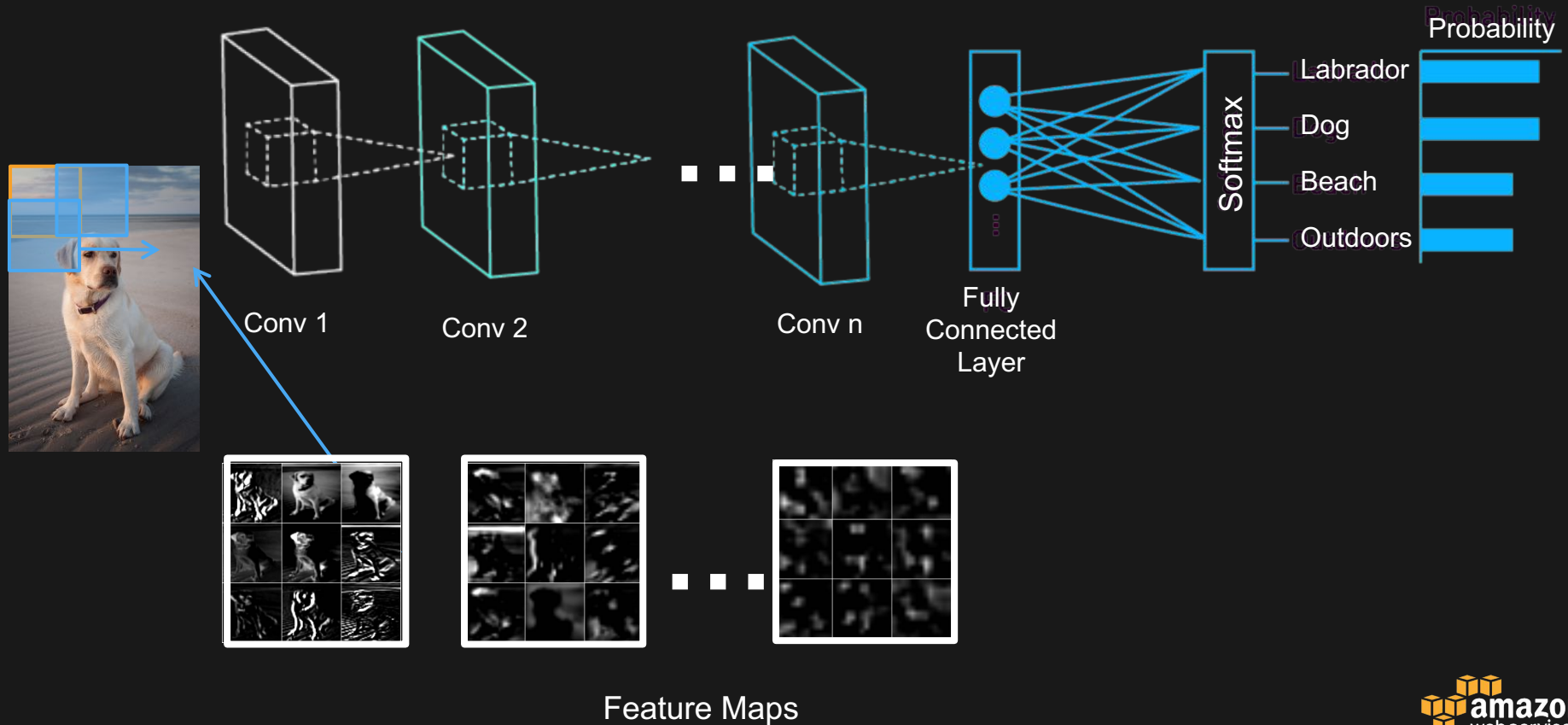
Ground Truth Generation
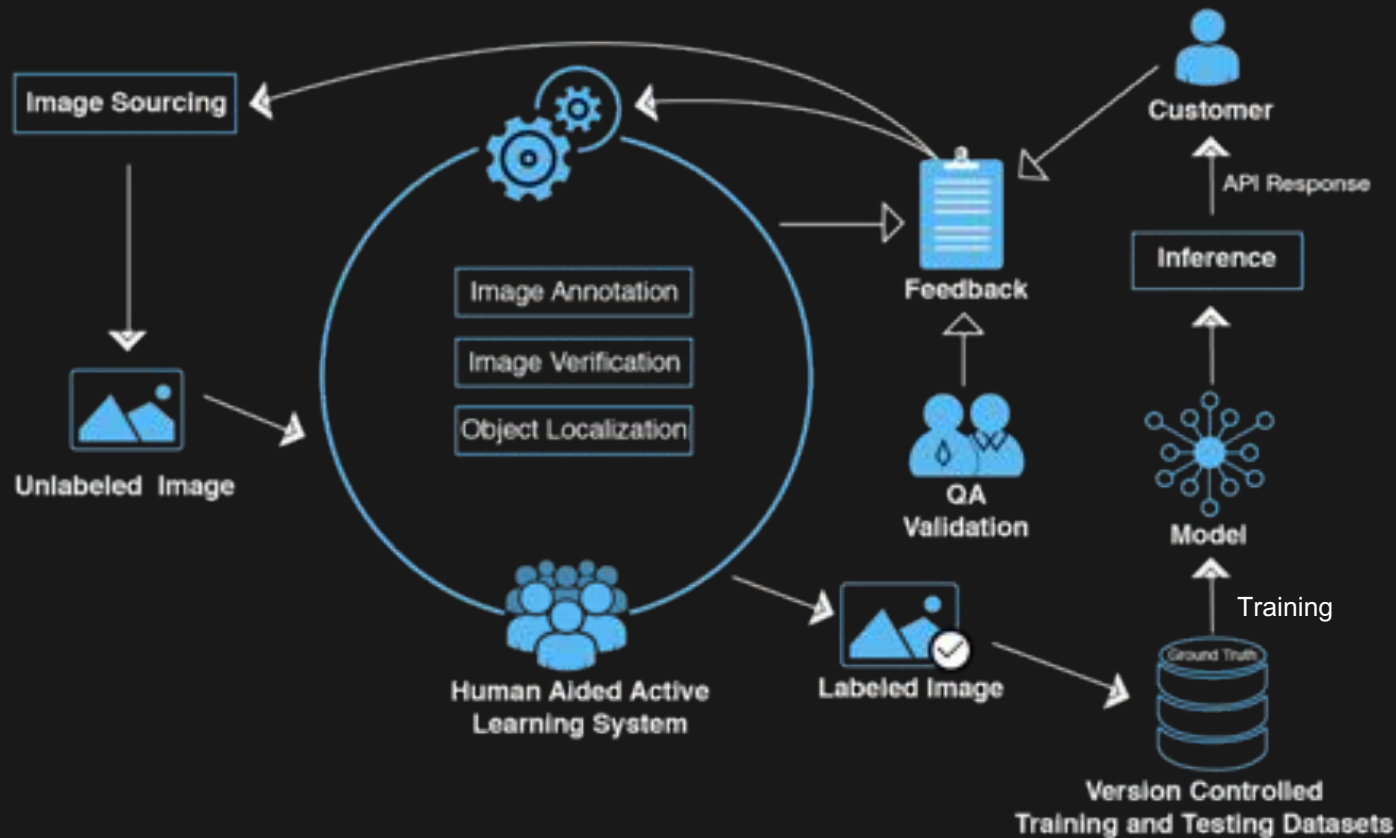
Artificial Intelligence

A system or service which can perform tasks that usually require human intelligence
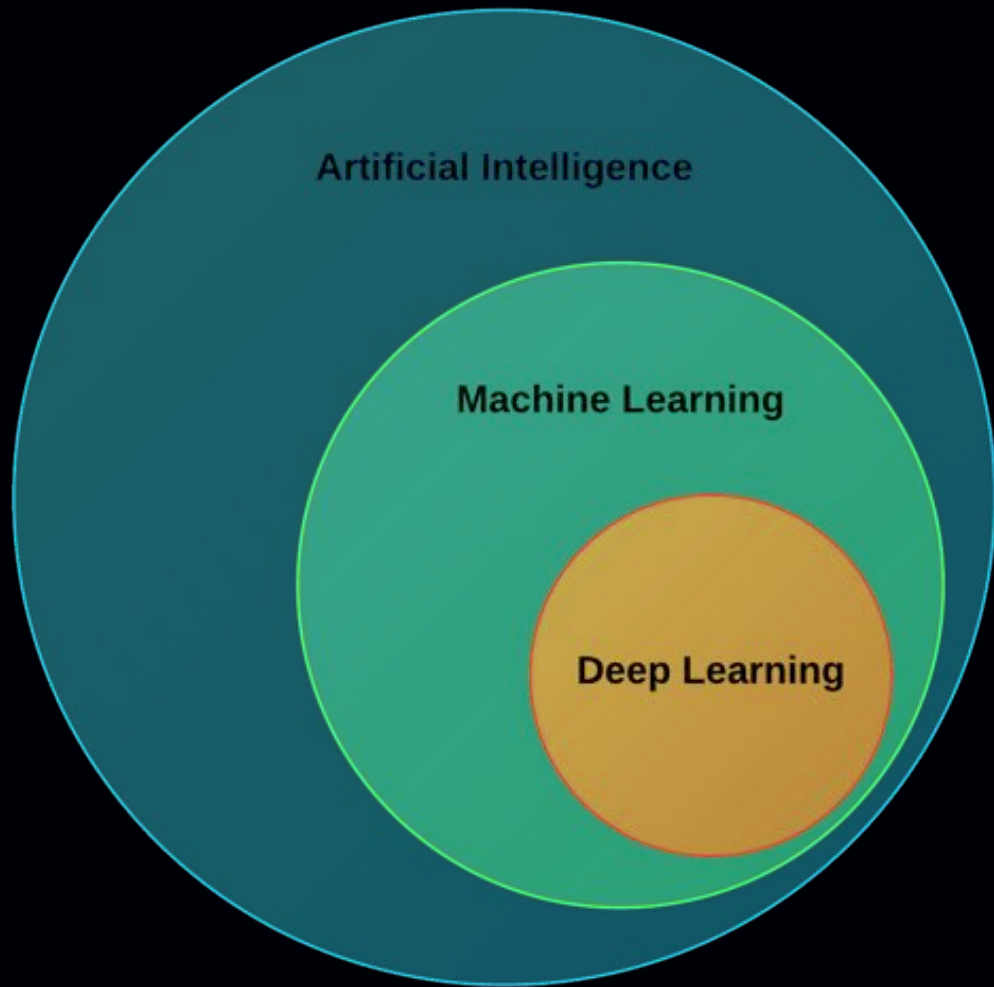
The Challenge For Artificial Intelligence: SCALE
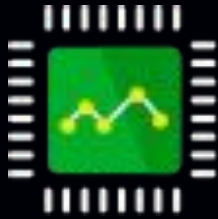
Training

Tons of GPUs

The Challenge For Artificial Intelligence: SCALE

Training

Tons of GPUs

Data

PBs of existing data

The Challenge For Artificial Intelligence: SCALE

Training

Tons of GPUs

Data

PBs of existing data

Prediction

Tons of GPUs and CPUs

Amazon AI Ecosystem

AI SERVICES	AMAZON REKOGNITION IMAGE RECOGNITION	AMAZON POLLY TEXT-TO-SPEECH	AMAZON LEX VOICE AND TEXT CHATBOTS

AI PLATFORMS	AMAZON MACHINE LEARNING	AMAZON EMR	SPARK & SPARKML

AI FRAMEWORKS

AWS DEEP LEARNING AMI

APACHE MXNET	TENSOR-FLOW	CAFFE	TORCH	THEANO	CNTK	KERAS

AI INFRASTRUCTURE

AMAZON EC2 P2 AND G2 GPUS	AMAZON EC2 CPUS	AWS LAMBDA	ENHANCED NETWORKING	AWS IOT AND AWS GREENGRASS

amazon web services

Amazon Rekognition: Images In, Rich Metadata Out

Object and scene detection
Facial analysis
Face comparison
Celebrity recognition
Image moderation

Amazon
Rekognition

mxnet

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%
Sky	52.4%
Sunrise	52.4%
Sunset	52.4%
Housing	51.4%
Coast	51.1%
Outdoors	51.1%

Object & Scene Detection

```
{
    "Labels": [
        {
            "Confidence": 91.47468566894531,
            "Name": "City"
        },
        {
            "Confidence": 91.47468566894531,
            "Name": "Downtown"
        },
        {
            "Confidence": 91.47468566894531,
            "Name": "Metropolis"
        },
        {
            "Confidence": 91.47468566894531,
            "Name": "Urban"
        },
        {
            "Confidence": 56.20014190673828,
            "Name": "Building"
        },
        {
            "Confidence": 56.20014190673828,
            "Name": "High Rise"
        },
        {
            "Confidence": 55.6546745300293,
            "Name": "Dock"
        },
        {
            "Confidence": 55.6546745300293,
            "Name": "Pier"
        },
        {
            "Confidence": 52.416603088378906,
            "Name": "Dawn"
        },
```

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%
eyes are open	96.2%
mouth is open	72.5%
does not have a mustache	77.6%
does not have a beard	97.1%

Facial Analysis

```
{
    "FaceDetails": [
        {
            "AgeRange": {
                "High": 38,
                "Low": 23
            },
            "Beard": {
                "Confidence": 97.11119842529297,
                "Value": false
            },
            "BoundingBox": {
                "Height": 0.42500001192092896,
                "Left": 0.1433333307504654,
                "Top": 0.11666666716337204,
                "Width": 0.2822222113609314
            },
            "Confidence": 99.8899917602539,
            "Emotions": [
                {
                    "Confidence": 93.29251861572266,
                    "Type": "HAPPY"
                },
                {
                    "Confidence": 28.57428741455078,
                    "Type": "CALM"
                },
                {
                    "Confidence": 1.4989674091339111,
                    "Type": "ANGRY"
                }
            ],
```
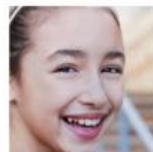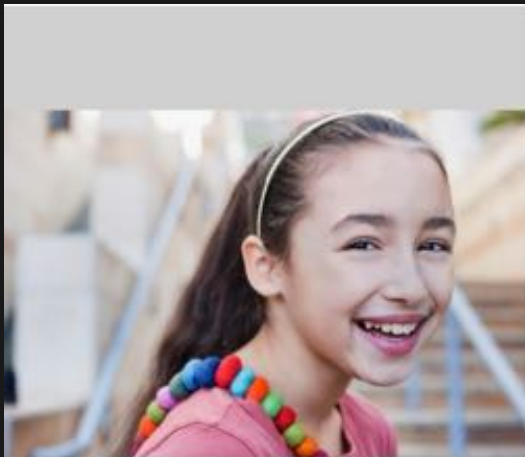
Facial Comparison
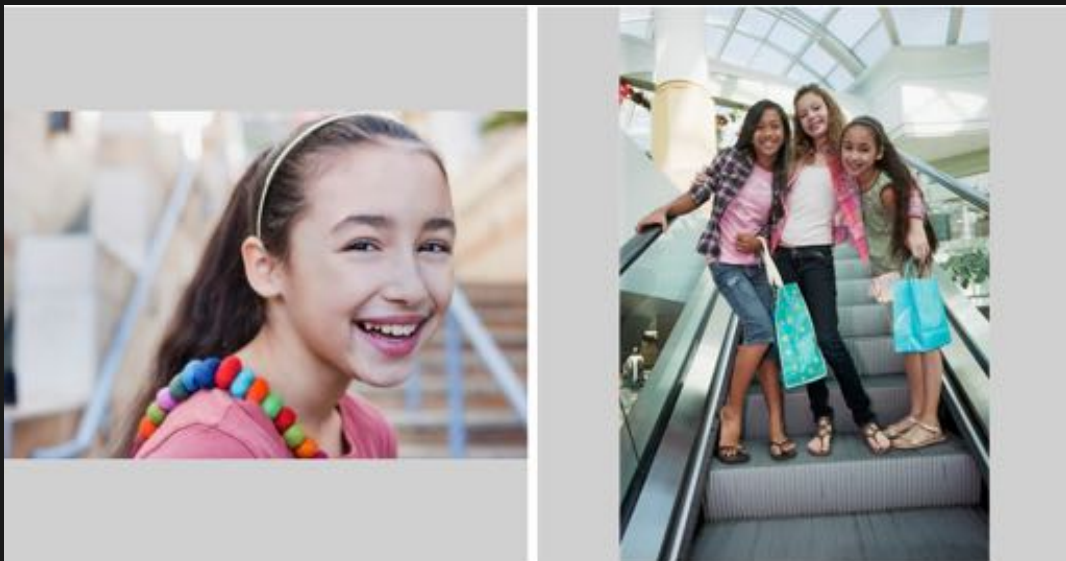
Facial Comparison

```
{
  "FaceMatches": [
    {
      "Face": {
        "BoundingBox": {
          "Height": 0.08444444090127945,
          "Left": 0.5766666531562805,
          "Top": 0.2177777737379074,
          "Width": 0.12666666507720947
        },
        "Confidence": 99.98779296875
      },
      "Similarity": 97
    },
    {
      "Face": {
        "BoundingBox": {
          "Height": 0.07888888567686081,
          "Left": 0.34166666865348816,
          "Top": 0.185555562376976,
          "Width": 0.11833333224058151
        },
        "Confidence": 99.99418640136719
      },
      "Similarity": 10
    },
    {
      "Face": {
        "BoundingBox": {
          "Height": 0.07444444298744202,
          "Left": 0.46666666865348816,
          "Top": 0.156666666626930237,
          "Width": 0.11166666448116302
        },
        "Confidence": 99.9874267578125
      },
      "Similarity": 10
    }
  ],
```
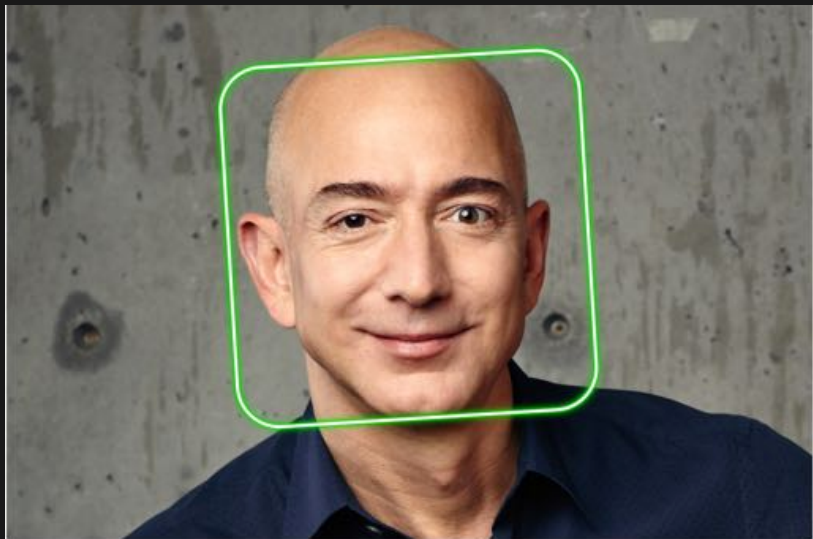
Celebrity Recognition
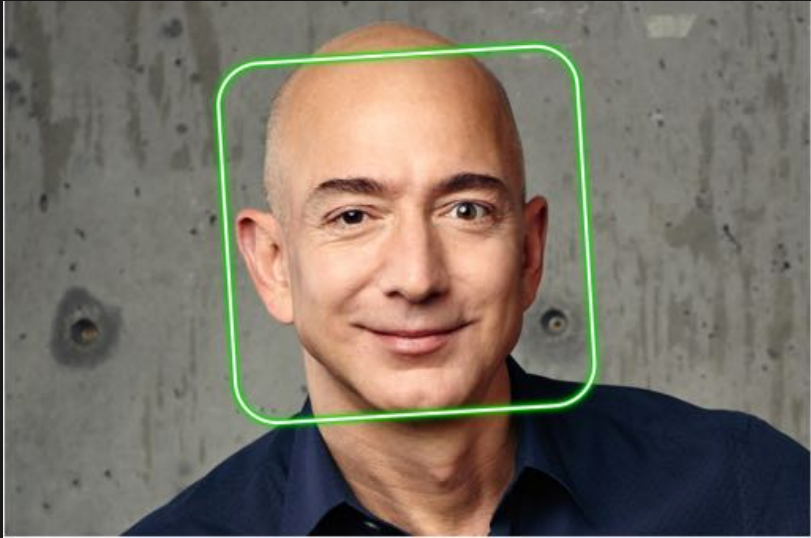
Jeff Bezos
Learn More

Match confidence   100%

Celebrity Recognition

```
{
    "CelebrityFaces": [
        {
            "Face": {
                "BoundingBox": {
                    "Height": 0.6766666769981384,
                    "Left": 0.273333340883255,
                    "Top": 0.09833333641290665,
                    "Width": 0.4511111080646515
                },
                "Confidence": 99.9476089477539,
                "Landmarks": [
                    {
                        "Type": "EYE_LEFT",
                        "X": 0.43007349967956543,
                        "Y": 0.4013440012931824
                    },
                    {
                        "Type": "EYE_RIGHT",
                        "X": 0.5722441077232361,
                        "Y": 0.39102792739868164
                    },
                    {
                        "Type": "NOSE",
                        "X": 0.5119736194610596,
                        "Y": 0.5130013823509216
                    },
                    {
                        "Type": "MOUTH_LEFT",
                        "X": 0.4434678554534912,
                        "Y": 0.6076163649559021
                    },
                    {
                        "Type": "MOUTH_RIGHT",
                        "X": 0.567210853099823,
                        "Y": 0.6049373149871826
                    }
                ],
                "Pose": {
                    "Pitch": -3.9133505821228027,
                    "Roll": -3.5155043601989746,
                    "Yaw": 5.368068218231201
                },
                "Quality": {
                    "Brightness": 56.59690475463867,
                    "Sharpness": 99.9945297241211
                }
            },
            "Id": "1SK7cR8M",
            "MatchConfidence": 100,
```

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

Image moderation

```
{
    "ModerationLabels": [
        {
            "Confidence": 83.55088806152344,
            "Name": "Suggestive",
            "ParentName": ""
        },
        {
            "Confidence": 83.55088806152344,
            "Name": "Female Swimwear Or Underwear",
            "ParentName": "Suggestive"
        }
    ]
}
```
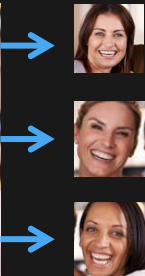
Amazon Rekognition: supported actions

CompareFaces
CreateCollection
DeleteCollection
DeleteFaces
DetectFaces
DetectLabels
DetectModerationLabels
GetCelebrityInfo
IndexFaces
ListCollections
ListFaces
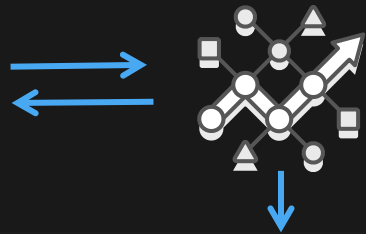RecognizeCelebrities
SearchFaces
SearchFacesByImage

Amazon
Rekognition

IndexFaces

SearchFacesbyImage

Nearest neighbor search

Collection

FaceID: 4c55926e-69b3-5c80-8c9b-78ea01d30690
Similarity: 97

FaceID: 02e56305-1579-5b39-ba57-9afb0fd8782d
Similarity: 92

FaceID: 02e56305-1579-5b39-ba57-9afb0fd8782d
Similarity: 85

Demo time

Amazon Rekognition Customers

- Digital Asset Management
- Media and Entertainment
- Travel and Hospitality
- Influencer Marketing
- Systems Integration
- Digital Advertising
- Consumer Storage
- Law Enforcement
- Public Safety
- eCommerce
- Education

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3

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Thank you!

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Amazon Rekognition Pricing

Image Analysis Tiers	Price per 1000 images processed
First 1 million images processed* per month	$1.00
Next 9 million images processed* per month	$0.80
Next 90 million images processed* per month	$0.60
Over 100 million images processed* per month	$0.40

Free Tier: 5000 images processed per month for first 12 months

Face Metadata Storage	Price per 1,000 face metadata stored per month
Face metadata stored	$0.01