

Hands-on with Amazon AI

Julien Simon

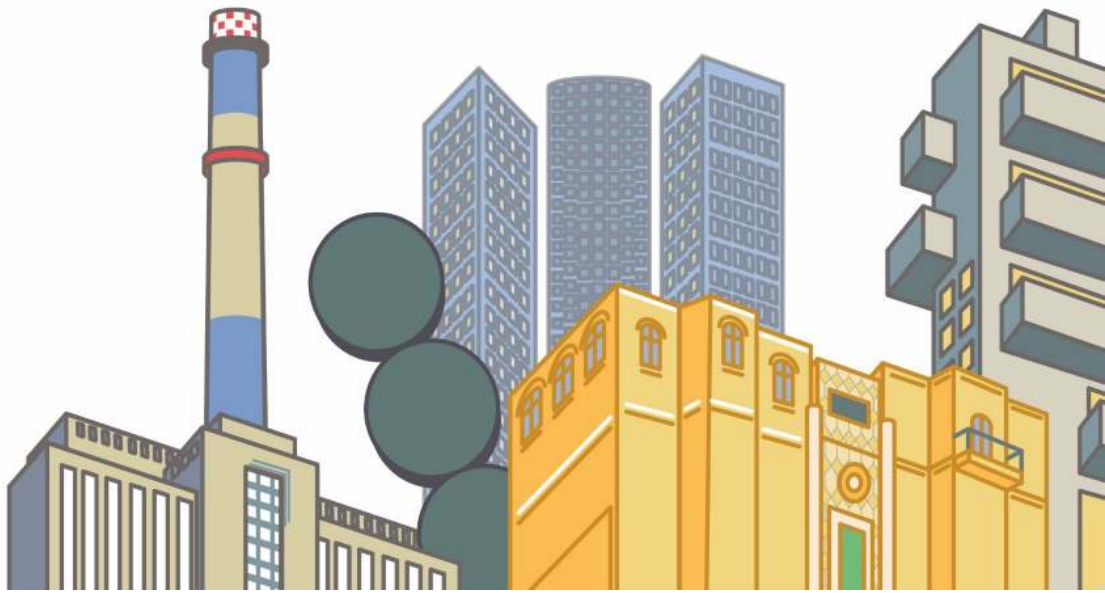
Principal Technical Evangelist

julsimon@amazon.fr

@julsimon



Pop-up Loft
TEL AVIV



Artificial Intelligence At Amazon

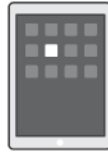
Thousands Of Employees Across The Company Focused on AI



Discovery &
Search



Fulfilment &
Logistics



Enhance
Existing Products



Define New
Categories Of
Products



Bring Machine
Learning To All



| JUST ASK



Amazon AI: Three New Deep Learning Services



**Poll
y**

Life-like Speech



**Rekogniti
on**

Image Analysis



**Le
x**

Conversational
Engine

Amazon Polly

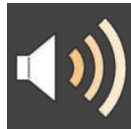
What is Amazon Polly

- A service that converts text into lifelike speech
- Offers 47 lifelike voices across 24 languages
- Low latency responses enable developers to build real-time systems
- Developers can store, replay and distribute generated speech

Amazon Polly: Quality

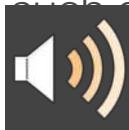
Natural sounding speech

A subjective measure of how close TTS output is to human speech.



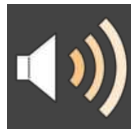
Accurate text processing

Ability of the system to interpret common text formats such as abbreviations, numerical sequences, homographs etc.



Today in Las Vegas, NV it's 54°F.

"We live for the music", live from the Madison Square Garden.



Highly intelligible

A measure of how comprehensible speech is.

"Peter Piper picked a peck of pickled peppers."



Amazon Polly: Language Portfolio

EMEA:

- British English
- Danish
- Dutch
- French
- German
- Icelandic
- Italian
- Norwegian
- Polish
- Portuguese
- Romanian
- Russian
- Spanish
- Swedish
- Turkish
- Welsh
- Welsh English

Americas:

- Brazilian Portuguese
- Canadian French
- English (US)
- Spanish (US)

A-PAC:

- Australian English
- Indian English
- Japanese

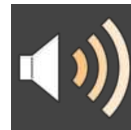


Amazon Polly features: SSML

Speech Synthesis Markup Language

is a W3C recommendation, an XML-based markup language for speech synthesis applications

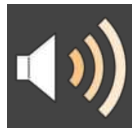
```
<speak>  
  My name is Kuklinski. It is spelled  
  <prosody rate='x-slow'>  
    <say-as interpret-as="characters">Kuklinski</say-as>  
  </prosody>  
</speak>
```



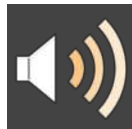
Amazon Polly features: Lexicons

Enables developers to customize the pronunciation of words or phrases

My daughter's name is Kaja.



```
<lexeme>  
  <grapheme>Kaja</grapheme>  
  <grapheme>kaja</grapheme>  
  <grapheme>KAJA</grapheme>  
  <phoneme>"kaI.ə</phoneme>  
</lexeme>
```



TEXT PROCESSING

Market grew by > 20%.

Market

grew

by

more
than

twenty
percent

'maɪ.kə
t

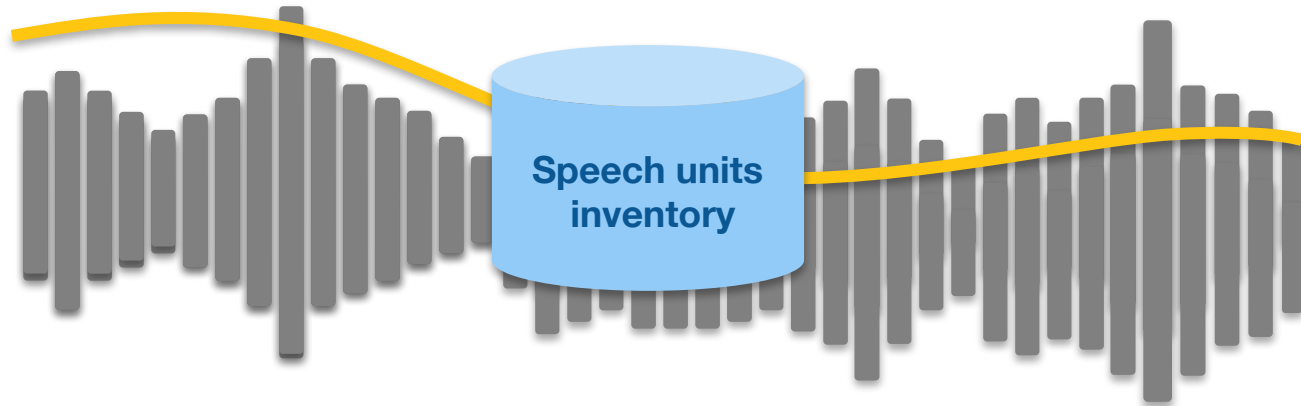
'gru

ba
I

'mou
I
'ðæn

'twɛn.ti
pə.'sɛnt

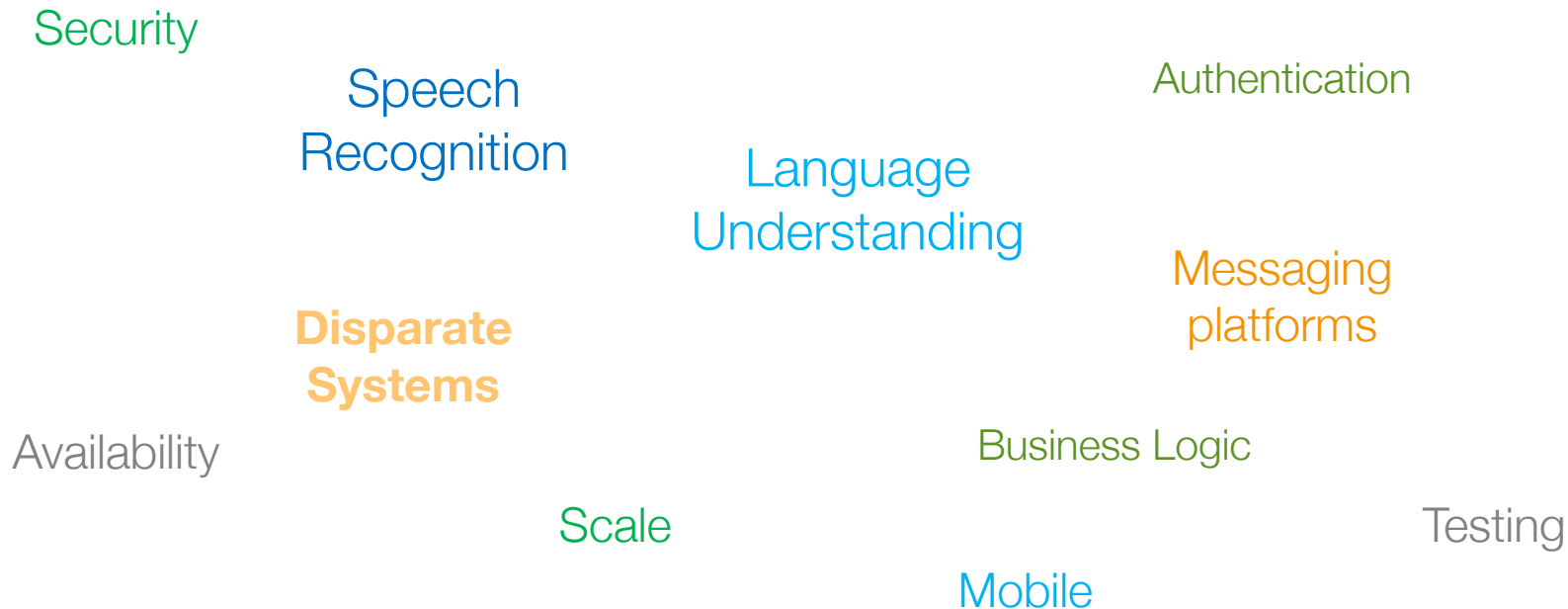
UNIT REPRESENTATION



Polly Demo

Amazon Lex

Developer Challenges



Conversational interfaces need to combine a large number of sophisticated algorithms and technologies

Text and Speech Language Understanding

Speech
Recognition

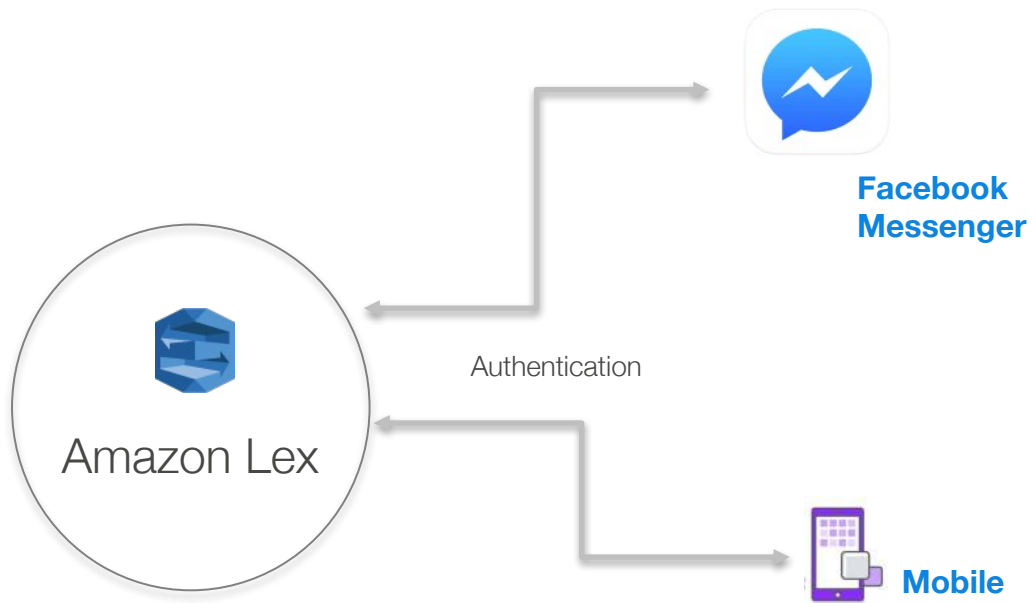


Natural Language
Understanding

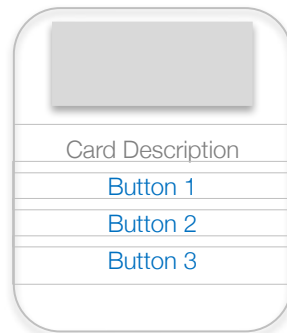
Powered by the same Deep Learning technology as Alexa

Deployment to Chat Services

One-Click Deployment

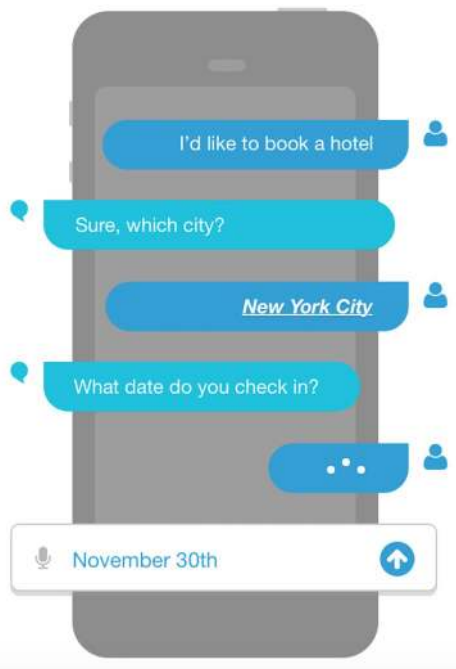


Rich Formatting



Lex Bot Structure

BookHotel



Intents

An Intent performs an action in response to natural language user input

Utterances

Spoken or typed phrases that invoke your intent

Slots

Slots are input data required to fulfill the intent

Fulfillment

Fulfillment mechanism for your intent



Utterances

I'd like to book a hotel

I want to make my hotel reservations

Can you help me book my hotel?

I want to book a hotel in New York City

Slots

Slot	Type	Values
Destination	City	New York City, Seattle, London, ...
Check In	Date	Valid dates
Check Out	Date	Valid dates

Slot Elicitation

I'd like to book a hotel

Sure what city do you want to book?

New York City

City
New York City

What date do you check in?

Nov 30th

Check In
11/30/2016

Fulfillment



Intents and slots passed to AWS Lambda function for business logic implementation.

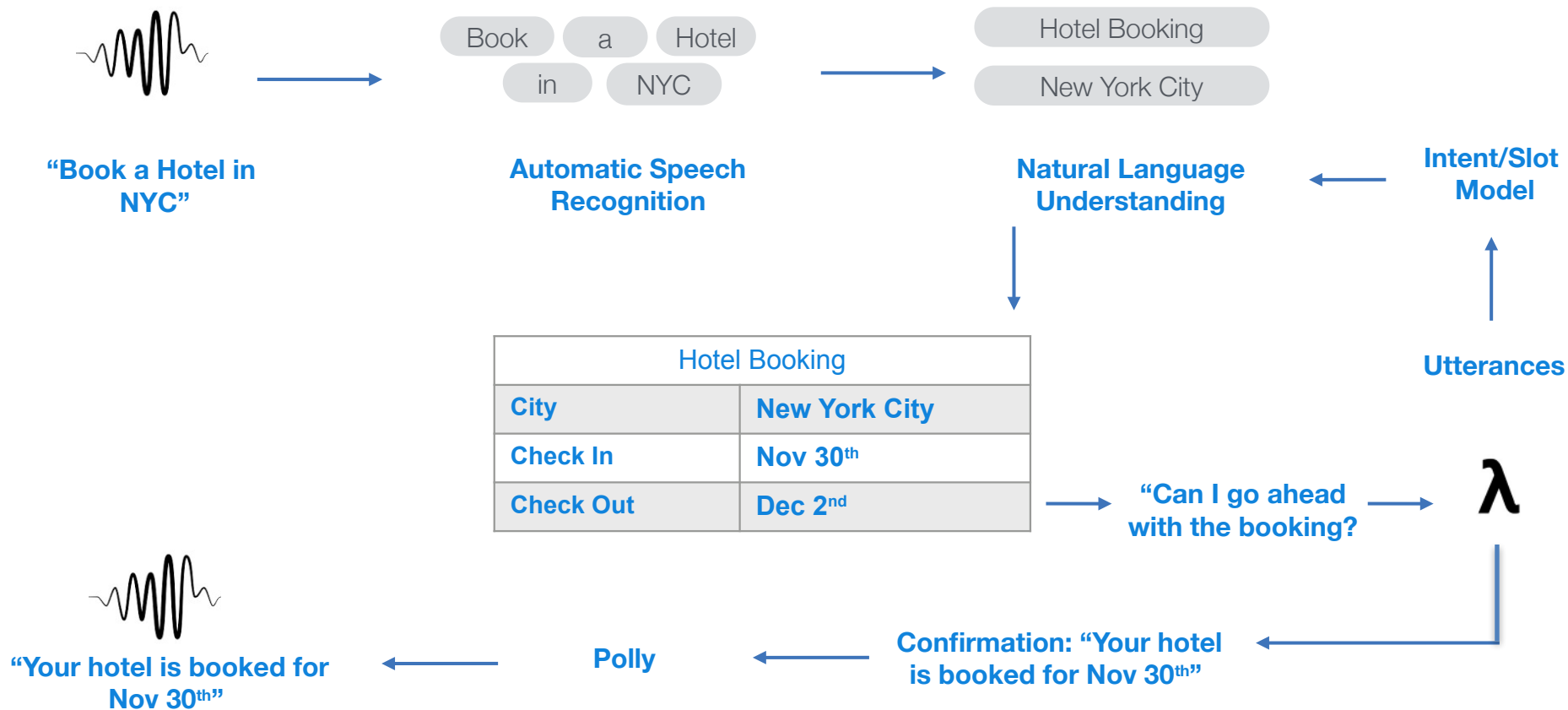
**AWS Lambda
Integration**



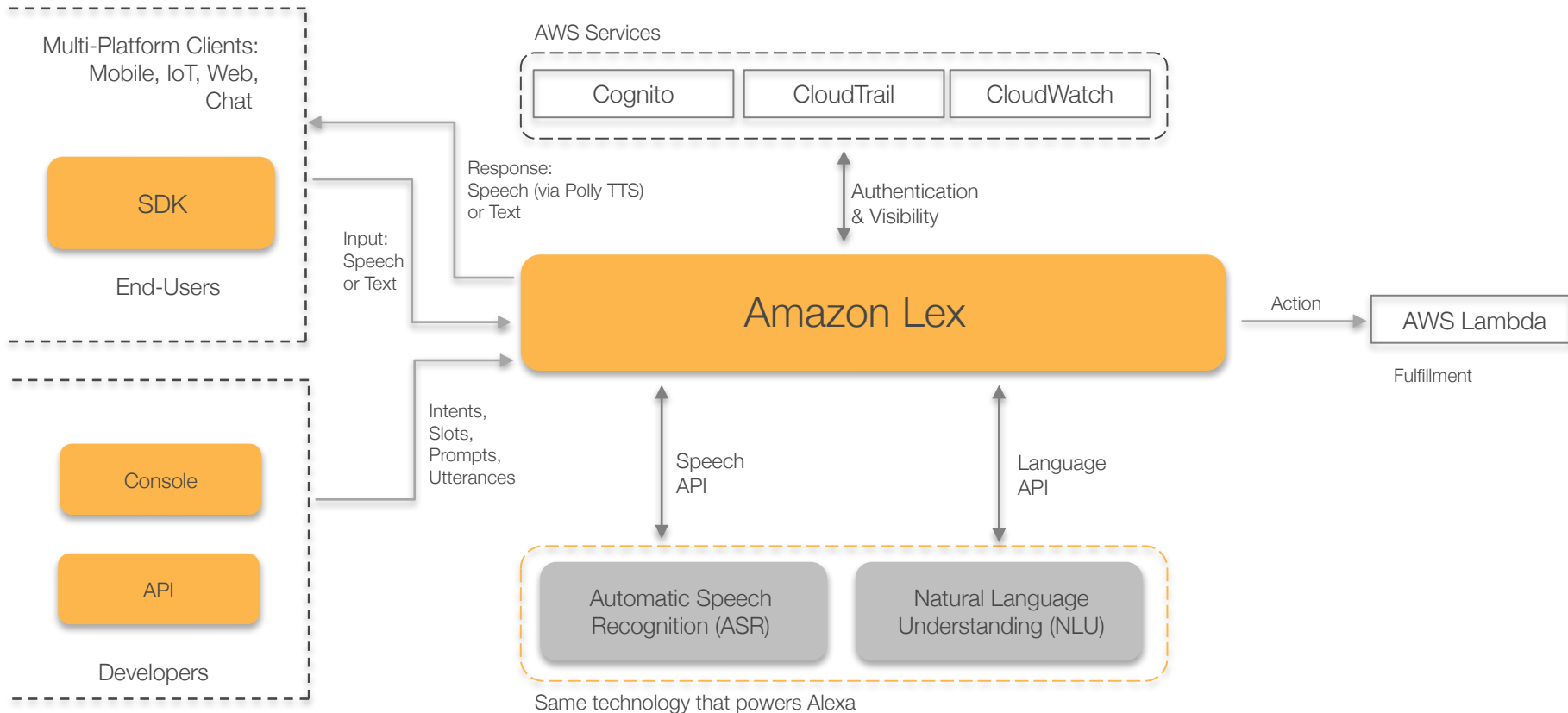
User input parsed to derive intents and slot values. Output returned to client for further processing.

Return to Client

“Book a Hotel”



Amazon Lex - Technology



Lex Demo

Amazon Rekognition

Amazon Rekognition

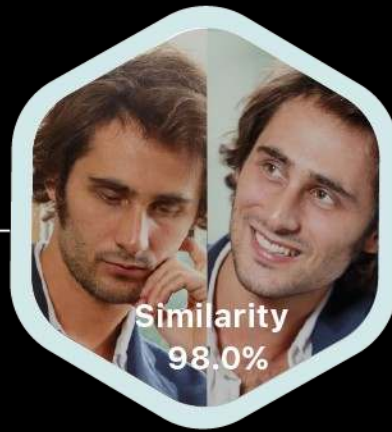
Deep learning-based image recognition service
Search, verify, and organize millions of images



Object and Scene
Detection



Facial
Analysis



Face
Comparison



Facial
Recognition



Amazon Rekognition API

Object and Scene Detection

Detect objects, scenes, and concepts in images



DetectLabels



Amazon Rekognition API



DetectLabels

```
{  
  "Confidence": 94.62968444824219,  
  "Name": "adventure"  
},  
{  
  "Confidence": 94.62968444824219,  
  "Name": "boat"  
},  
{  
  "Confidence": 94.62968444824219,  
  "Name": "rafting"  
},  
. . .
```



Amazon Rekognition API

Facial Analysis

Detect face and key facial characteristics



DetectFaces



Amazon Rekognition API



[

{

```
"BoundingBox": {  
  "Height": 0.3449999988079071,  
  "Left": 0.096666666388511658,  
  "Top": 0.27166667580604553,  
  "Width": 0.23000000417232513  
},  
"Confidence": 100,  
"Emotions": [  
  {"Confidence": 99.1335220336914,  
   "Type": "HAPPY"},  
  {"Confidence": 3.3275485038757324,  
   "Type": "CALM"},  
  {"Confidence": 0.31517744064331055,  
   "Type": "SAD"}  
],  
"Eyeglasses": {"Confidence": 99.8050537109375,  
  "Value": false},  
"EyesOpen": {"Confidence": 99.99979400634766,  
  "Value": true},  
"Gender": {"Confidence": 100,  
  "Value": "Female"}
```

DetectFaces



Facial Analysis

Demographic Data

Male
97.4%

Sentiment Expressed

Eyes are open
100%

Facial Landmarks

Happy
96.0%

Smiling
96.3%

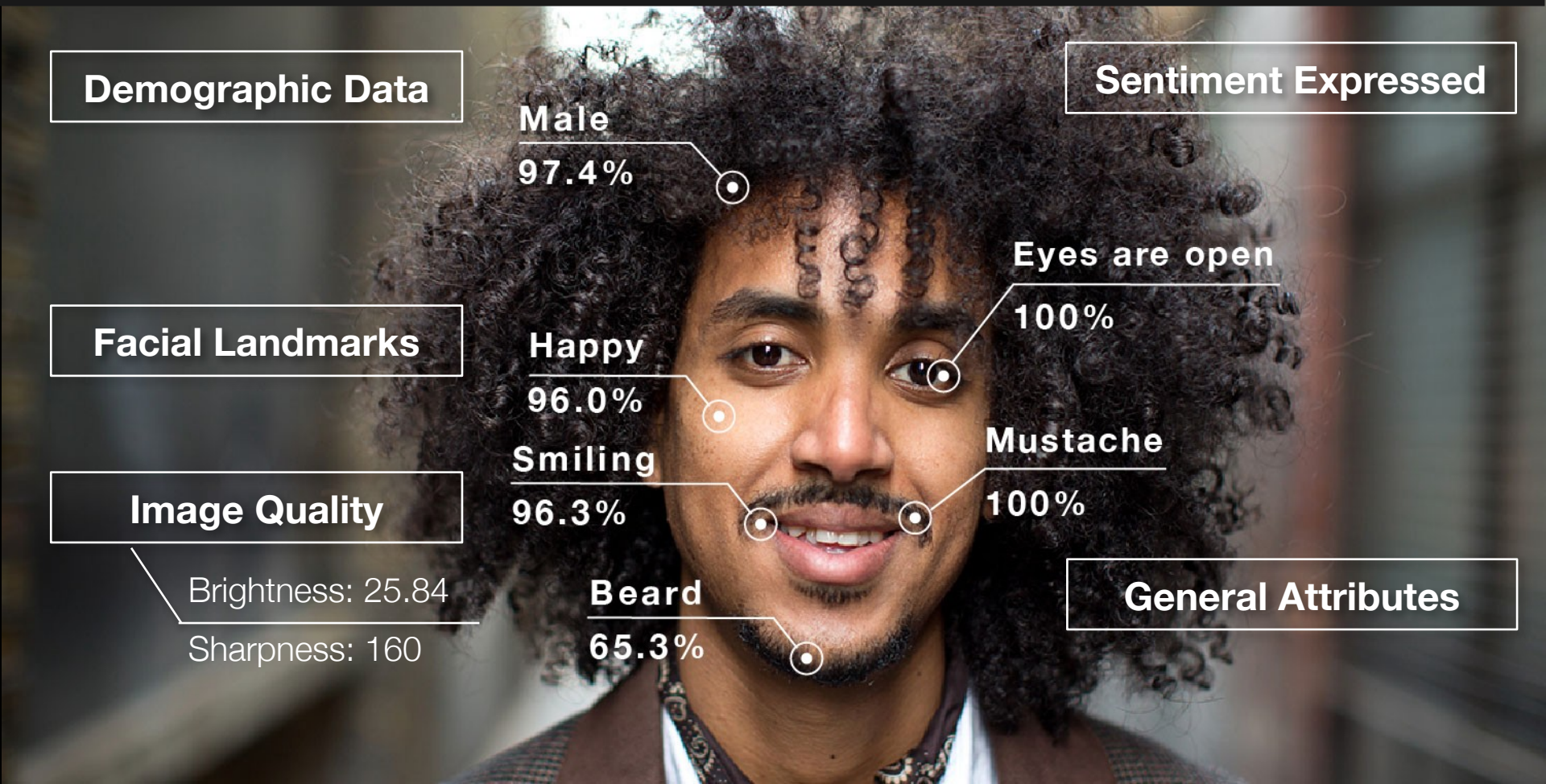
Mustache
100%

Image Quality

Brightness: 25.84
Sharpness: 160

Beard
65.3%

General Attributes



Amazon Rekognition API

Face Comparison

Face-based user verification



CompareFaces



Amazon Rekognition API

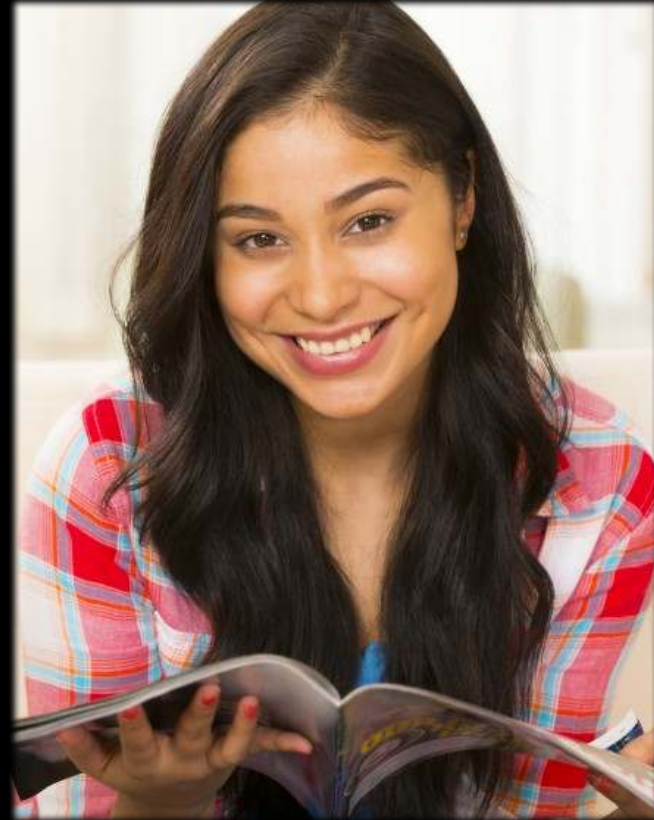
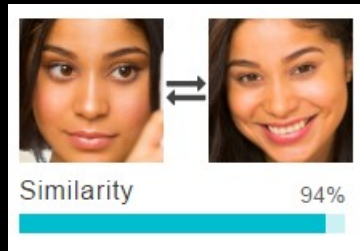


CompareFaces

```
{
  "FaceMatches": [
    {
      "Face": {
        "BoundingBox": {
          "Height": 0.2683333456516266,
          "Left": 0.5099999904632568,
          "Top": 0.1783333271741867,
          "Width": 0.17888888716697693,
          "Confidence": 99.99845123291016,
          "Similarity": 96
        },
        "SourceImageFace": {
          "BoundingBox": {
            "Height": 0.23983436822891235,
            "Left": 0.28333333134651184,
            "Top": 0.351423978805542,
            "Width": 0.1599999964237213,
            "Confidence": 99.99344635009766
          }
        }
      }
    },
    {
      "Face": {
        "BoundingBox": {
          "Height": 0.2383333295583725,
          "Left": 0.6233333349227905,
          "Top": 0.3016666769981384,
          "Width": 0.15888889133930206,
          "Confidence": 99.71249389648438,
          "Similarity": 0
        }
      }
    }
  ],
}
```



Face Comparison



Amazon Rekognition API

Face Recognition
Index and Search faces in a collection



IndexFaces

SearchFacesByImage

Index

Collection

Search



Amazon Rekognition API



IndexFace

```
{  
  f7a3a278-2a59-5102-a549-a12ab1a8cae8,  
  02e56305-1579-5b39-ba57-9afb0fd8782d,  
  4c55926e-69b3-5c80-8c9b-78ea01d30690  
}
```

Face



transformed

Face ID & vector<float>

f7a3a278-2a59-5102-a549-a12ab1a8cae8
&
v1

02e56305-1579-5b39-ba57-9afb0fd8782d
&
v2

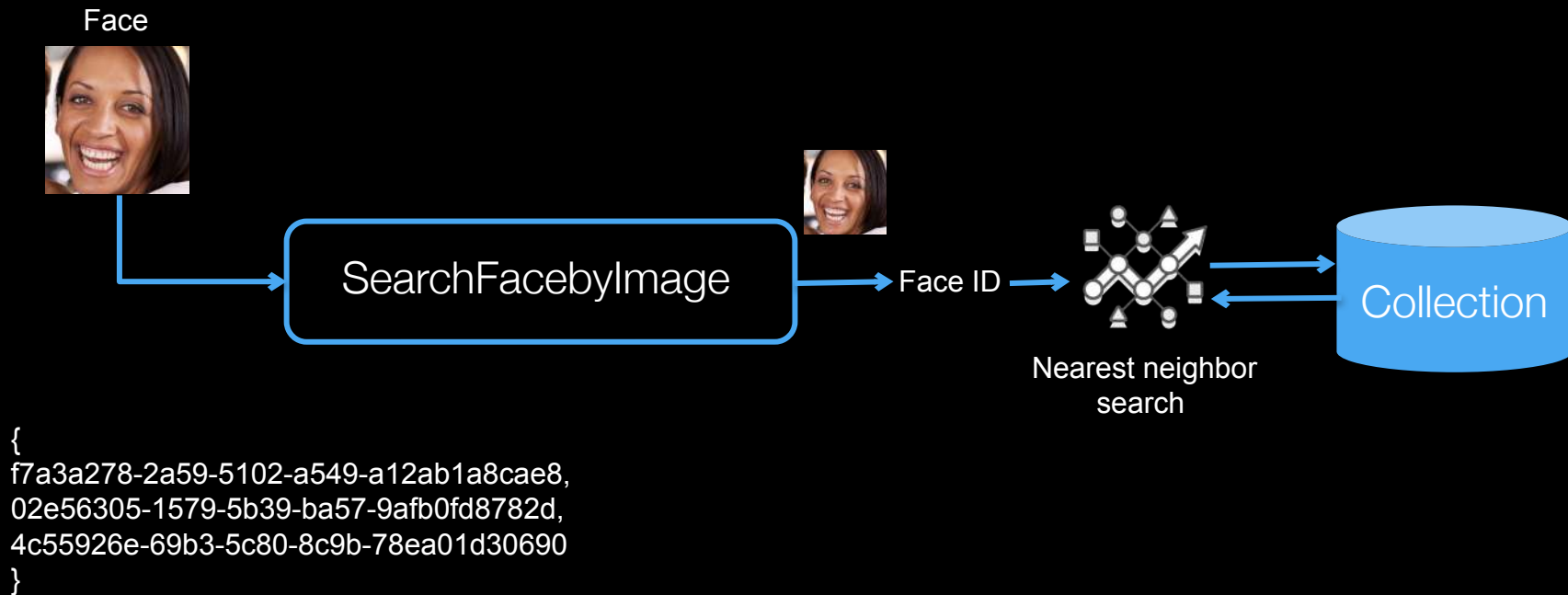
4c55926e-69b3-5c80-8c9b-78ea01d30690
&
v3

stored

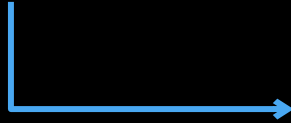
Collection



Amazon Rekognition API



Face Recognition



Rekognition Demo

Thank You

Julien Simon

julsimon@amazon.fr

@julsimon

**Your feedback
is important to us!**



Pop-up Loft
TEL AVIV

