An introduction to Amazon AI

Julien Simon, Principal Technical Evangelist, AWS
julsimon@amazon.fr
@julsimon

© 2016, Amazon Web Services, Inc. or its Affiliates. All rights reserved.

amazon web services

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 intelligibile

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

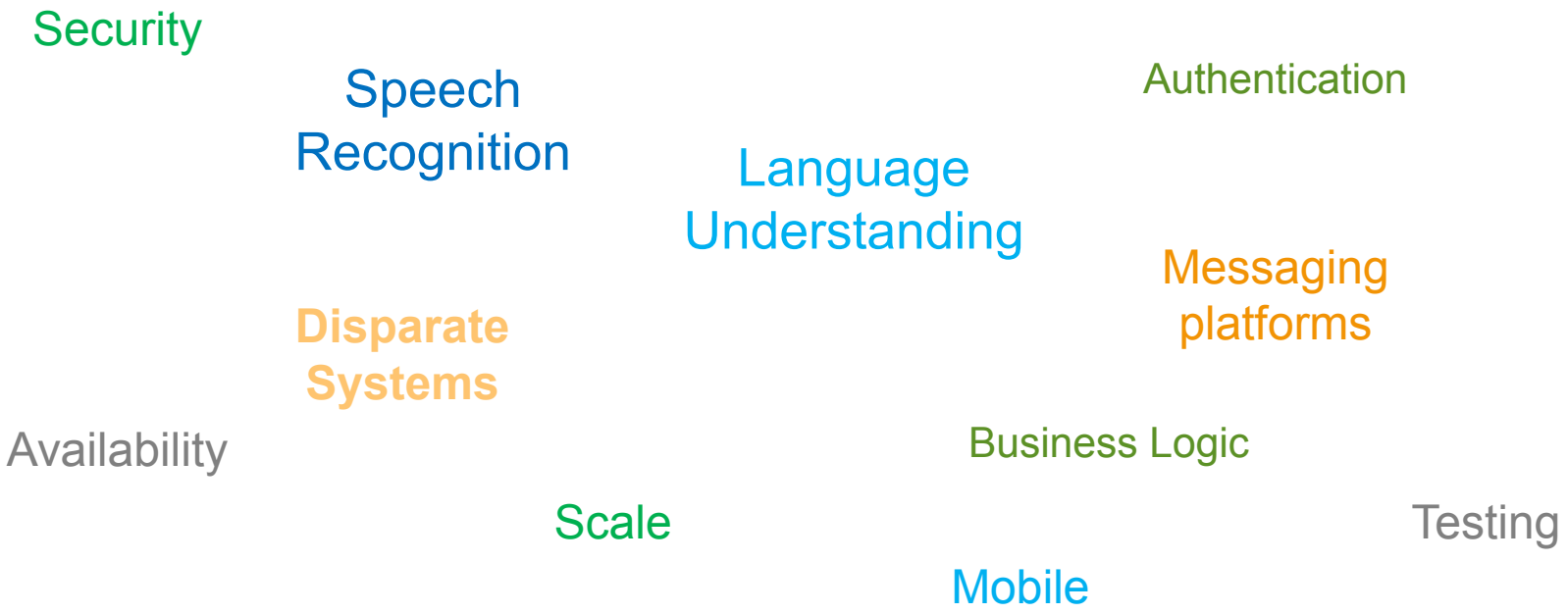
Enables developers to customize the pronunciation of words or phrases

My daughter's name is Kaja.

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

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

Amazon Lex - Benefits

Easy to use

High quality Text and Speech Language Understanding

Seamlessly deploy and scale

Built-in integration with the AWS platform

Cost effective

Amazon Lex – Use Cases

Informational Bots

Chatbots for everyday consumer requests

- News updates
- Weather information
- Game scores ….

Application Bots

Build powerful interfaces to mobile applications

- Book tickets
- Order food
- Manage bank accounts ….

Enterprise Productivity Bots

Streamline enterprise work activities and improve efficiencies

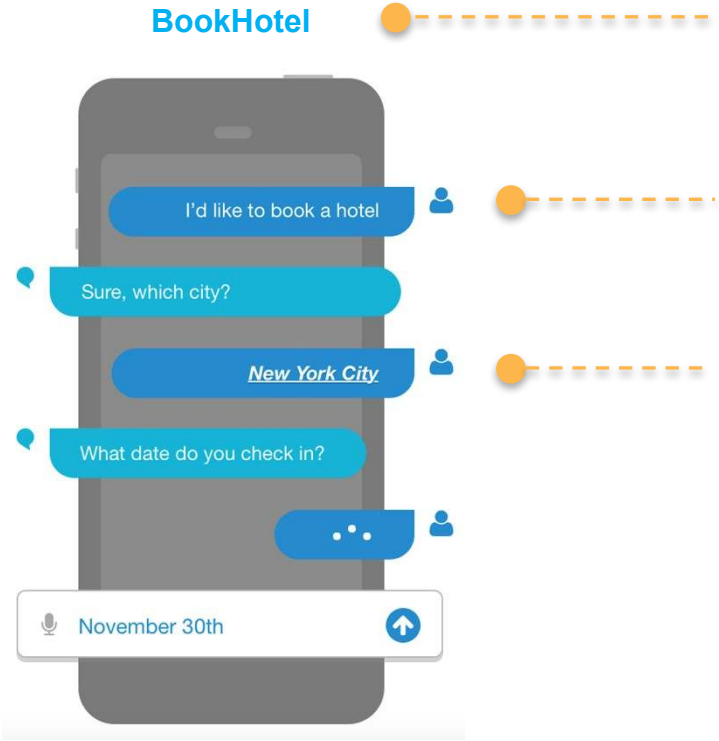
- Check sales numbers
- Marketing performance
- Inventory status ….

Internet of Things (IoT) Bots

Enable conversational interfaces for device interactions

- Wearables
- Appliances
- Auto ….

Lex Bot Structure

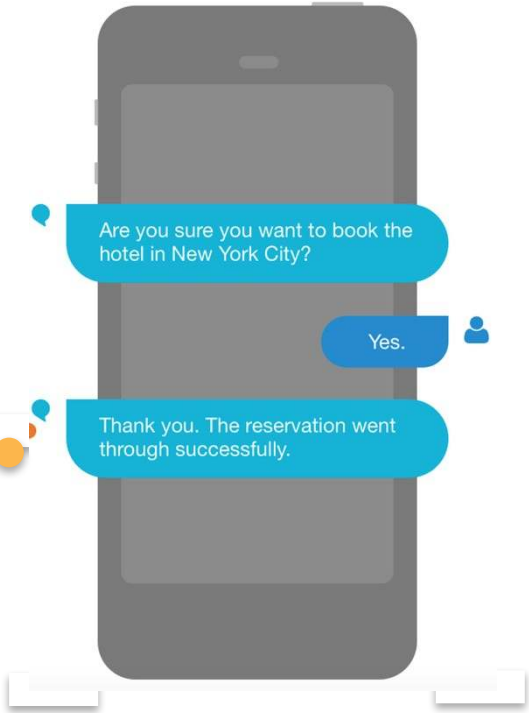


Intents
An Intent performs an action in response to natural language user input

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

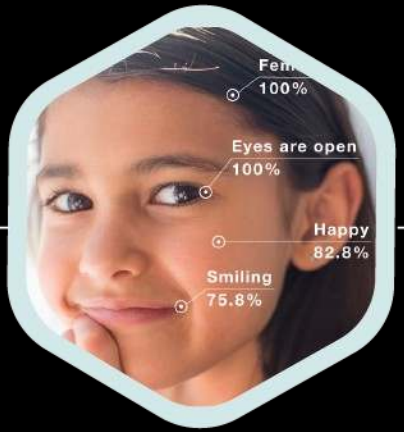


Amazon Rekognition

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

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

Amazon Rekognition API

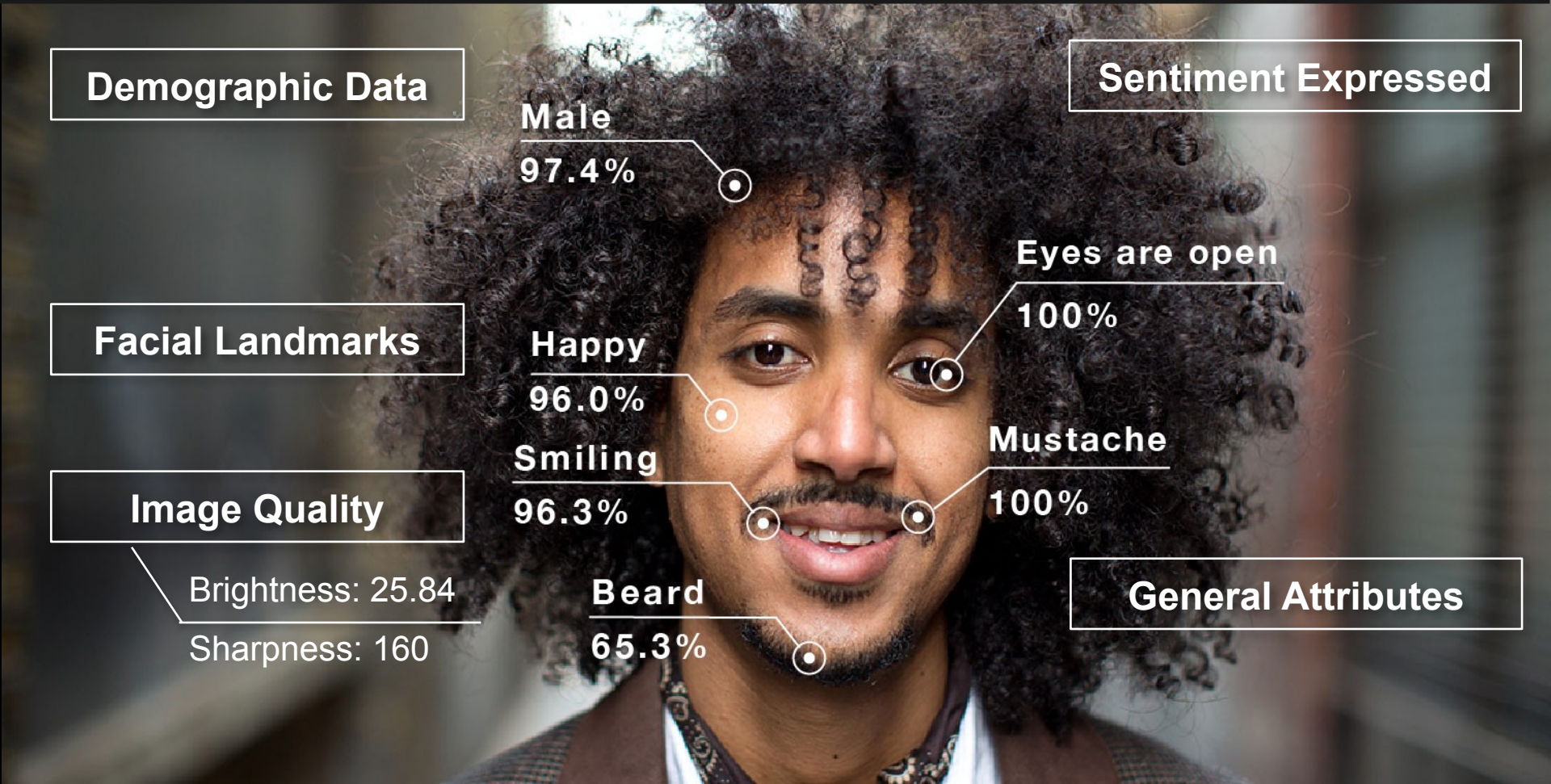
DetectFaces

```
[
    {
"BoundingBox": {
    "Height": 0.3449999988079071,
    "Left": 0.09666666388511658,
    "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"}
```


Facial Analysis

Detect face and key facial characteristics

Facial Analysis



Amazon Rekognition API

Face Comparison

Face-based user verification

CompareFaces


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

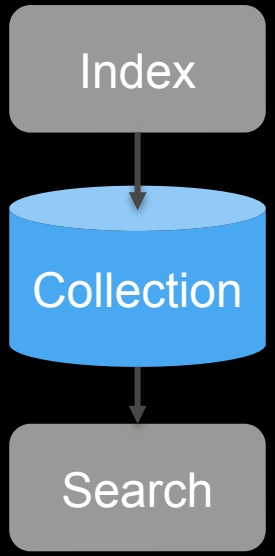
Amazon Rekognition API

Face Recognition

Index and Search faces in a collection

IndexFaces

SearchFacesByImage



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

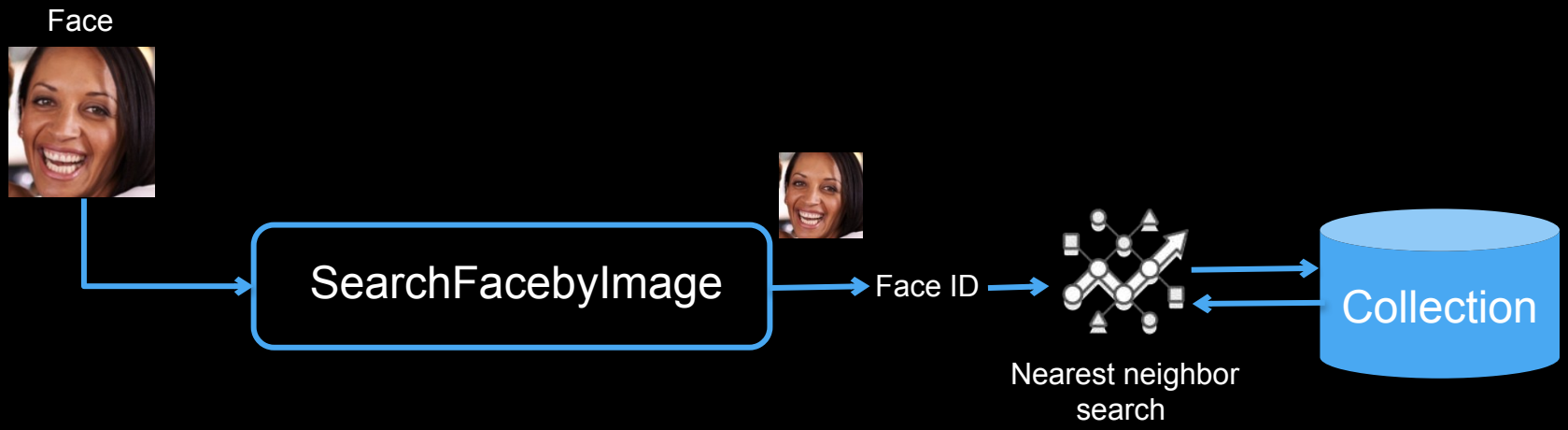
02e56305-1579-5b39-ba57-9afb0fd8782d
&
v2

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

stored

Collection

Amazon Rekognition API



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

Thank you!

Julien Simon, Principal Technical Evangelist, AWS
julsimon@amazon.fr
@julsimon

amazon web services