

Hands-on tutorials

Detect, Analyze, and Compare Faces with Amazon Rekognition



Detect, Analyze, and Compare Faces with Amazon Rekognition:

Hands-on tutorials

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Detect, Analyze, and Compare Faces with Amazon Rekognition

AWS experience	Beginner
Time to complete	10 minutes
Cost to complete	Free Tier eligible
Services used	Amazon Rekognition
Last updated	July 11, 2022

Overview

In this tutorial, you will learn how to use the face recognition features in Amazon Rekognition using the AWS Management Console. Amazon Rekognition is a deep learning-based image and video analysis service.

As a developer, you might face the challenge of facial recognition and comparison if you are developing an employee verification system, or need to automate video editing or provide secondary authentication for other applications. To solve this, you could develop your own machine learning model, develop an API, and manage your own infrastructure. This option is expensive, requires advanced knowledge, and is time intensive.

An easier route is to use Amazon Rekognition, which can detect faces in an image or video, find facial landmarks such as the position of eyes, and detect emotions such as happy or sad in near-real time or in batches without management of infrastructure or modeling.

In this tutorial, you will use [Amazon Rekognition](#) to analyze an image and then compare it to other images to see if the faces are the same.

This tutorial is a demo of the functionality that is available when using the AWS CLI or the Rekognition API. For production or proof of concept implementations, we recommend using these programmatic interfaces rather than the Amazon Rekognition console.

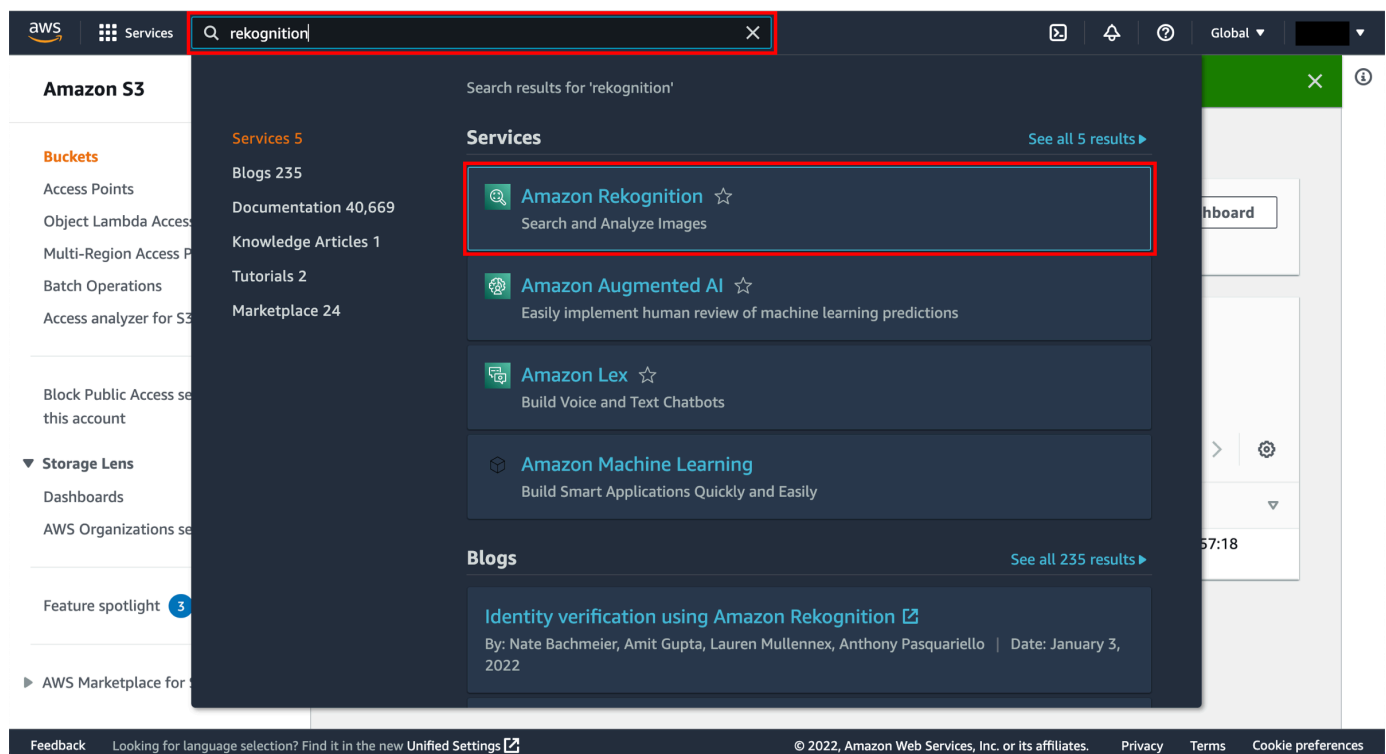
Implementation

Step 1: Analyze faces

In this step, you will use the facial analysis feature in Amazon Rekognition to see the detailed JSON response you can receive from analyzing one image.

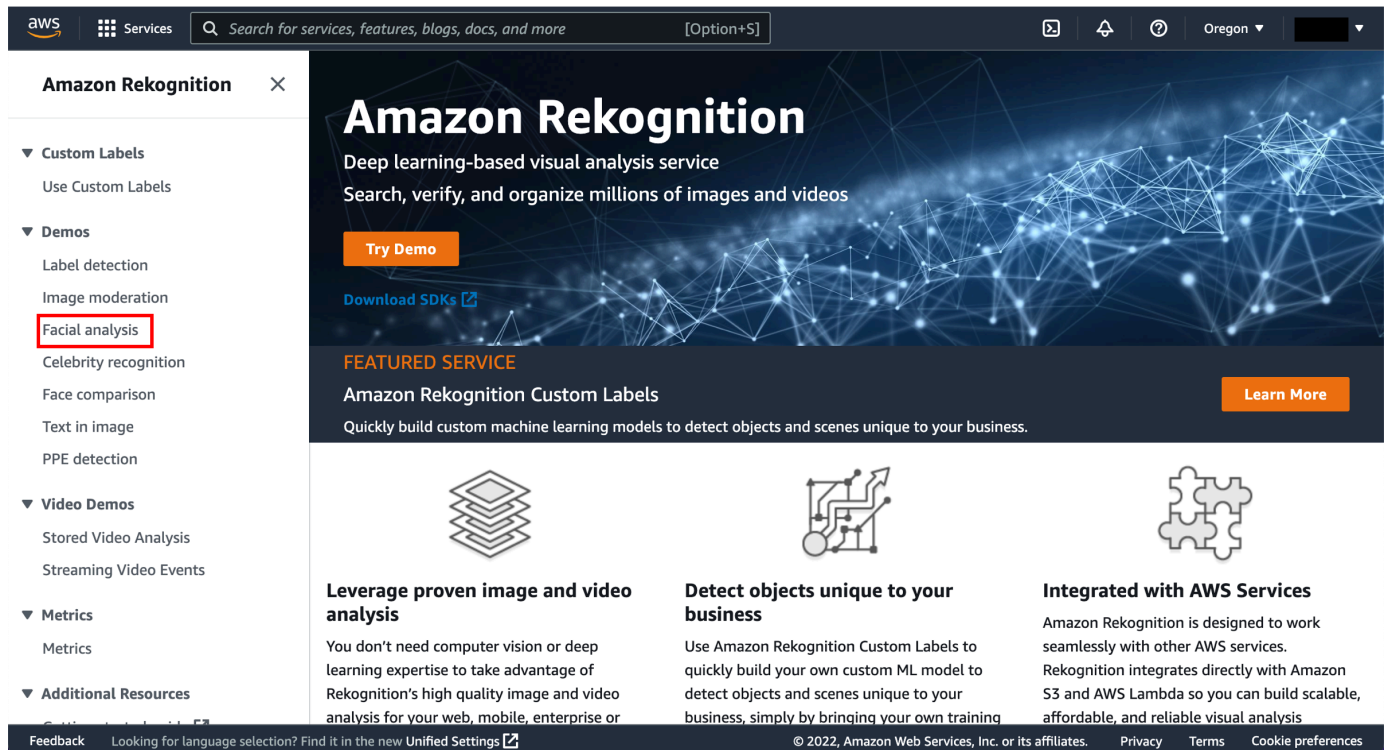
1. Open the console

Open the [AWS Management Console](#), so you can keep this step-by-step guide open. When the screen loads, enter your user name and password to get started. Then type **Rekognition** in the search bar and select **Rekognition** to open the service console.



2. Select Facial analysis

To start, select **Facial analysis** in the panel navigation on the left. This feature allows you to analyze faces in an image and receive a JSON response.



The screenshot shows the Amazon Rekognition console. On the left, the 'Facial analysis' option is highlighted under the 'Demos' section. The main content area features the 'Amazon Rekognition' header, a description of the service, and three featured service sections: 'Leverage proven image and video analysis', 'Detect objects unique to your business', and 'Integrated with AWS Services'.

3. Save the first sample image

Open and save the first sample image for this tutorial [here](#).



4. Upload sample image

Click the orange **Upload** button and select the sample image you just saved.

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Amazon Rekognition

- Custom Labels
 - Use Custom Labels
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 - Text in image
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- Video Demos
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- Additional Resources

Facial analysis

Get a complete analysis of facial attributes, including confidence scores. [Learn more](#)



Choose a sample image




Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

[Upload](#) or drag and drop

Results

looks like a face	99.9 %
appears to be female	99.9 %
age range	25 - 35 years old
not smiling	63.5 %
appears to be happy	70 %
wearing glasses	99.9 %

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5. Review the quick results

Notice that under the Results dropdown, you can click through and see quick results for each face that was detected.

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Amazon Rekognition

- Custom Labels
 - Use Custom Labels
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 - Facial analysis
 - Celebrity recognition
 - Face comparison**
 - Text in image
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Facial analysis

Get a complete analysis of facial attributes, including confidence scores. [Learn more](#)



Choose a sample image




Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

[Upload](#) or drag and drop

Results



looks like a face	99.9 %
appears to be male	99.9 %
age range	56 - 64 years old
smiling	96.2 %
appears to be happy	99.9 %
not wearing glasses	97.6 %

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6. Open the Response dropdown

Click on the **Response** dropdown to see the JSON results.

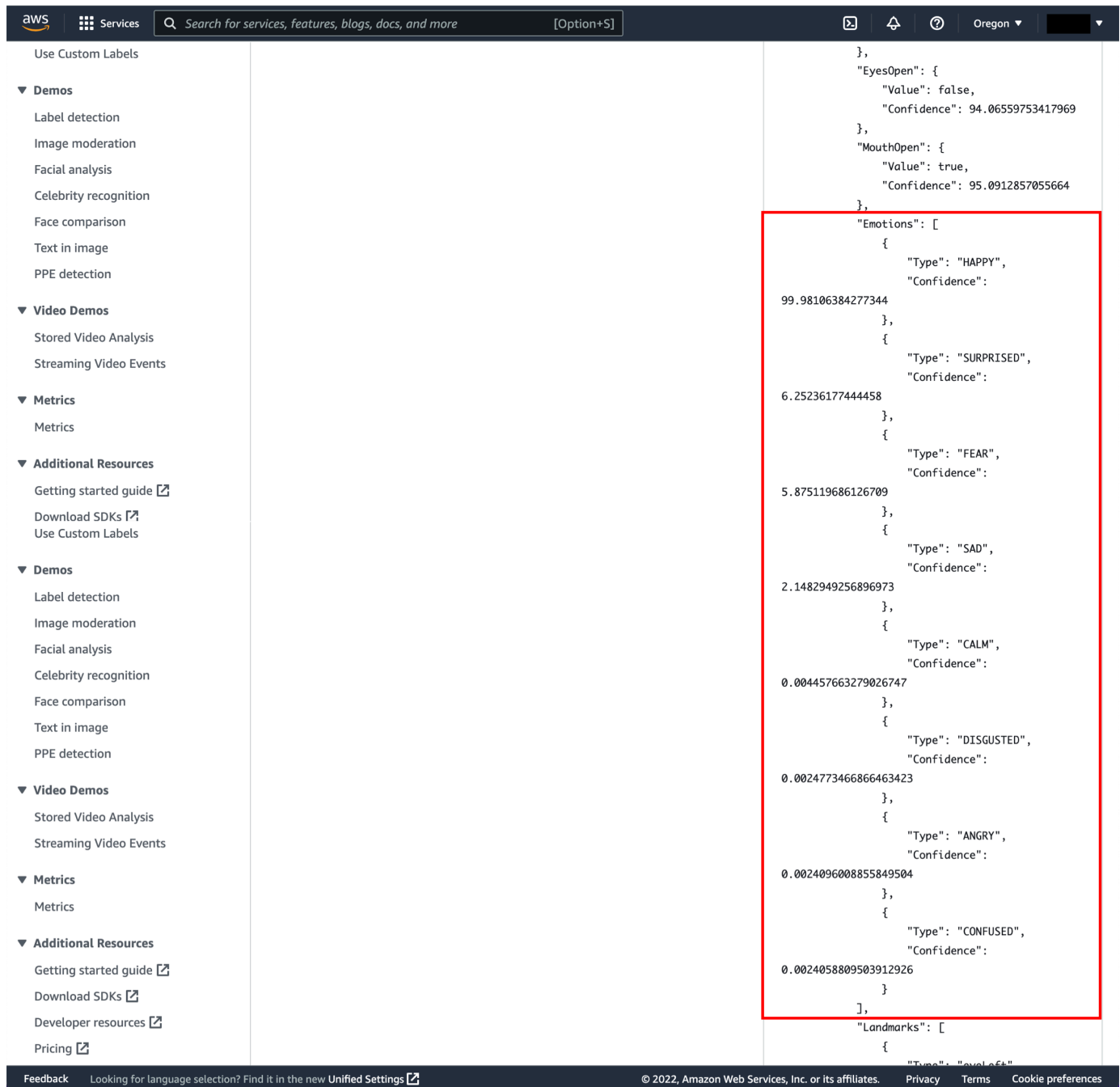
The screenshot shows the AWS Rekognition console interface. On the left is a navigation menu with sections: 'Use Custom Labels', 'Demos' (containing Label detection, Image moderation, Facial analysis, Celebrity recognition, Face comparison, Text in image, and PPE detection), 'Video Demos' (containing Stored Video Analysis and Streaming Video Events), 'Metrics' (containing Metrics), and 'Additional Resources' (containing Getting started guide, Download SDKs, Developer resources, and Pricing). The main content area features a large image of a family with bounding boxes, a 'Choose a sample image' section with two thumbnails, and a 'Use your own image' section with an 'Upload' button and a 'Use image URL' input field. On the right, a detailed analysis of a face is shown, including a list of attributes and their confidence scores: 'looks like a face' (99.9%), 'appears to be male' (99.9%), 'age range' (56 - 64 years old), 'smiling' (96.2%), 'appears to be happy' (99.9%), and 'not wearing glasses' (97.6%). Below this list are two expandable sections: 'Request' and 'Response'. The 'Response' section is highlighted with a red rectangle, indicating it should be clicked to view the JSON results.

Attribute	Confidence
looks like a face	99.9 %
appears to be male	99.9 %
age range	56 - 64 years old
smiling	96.2 %
appears to be happy	99.9 %
not wearing glasses	97.6 %

7. View the JSON results

Notice that under the emotions results, there are numerous detected emotions. Happy has a 99.98% confidence rating.

As a developer, detecting emotions in images and videos makes it possible to quickly catalog a digital library by emotion. Another use case for detecting emotions is to amplify ad targeting so users receive a personalized experience tailored to the current emotion.



The screenshot shows the AWS IAM console interface. The left sidebar contains a navigation menu with sections: 'Demos', 'Video Demos', 'Metrics', and 'Additional Resources'. Under 'Demos', 'Face comparison' is selected. The main content area displays the 'Emotions' section, which is highlighted with a red box. The 'Emotions' section shows a list of detected emotions and their confidence scores.

```

{
  "EyesOpen": {
    "Value": false,
    "Confidence": 94.06559753417969
  },
  "MouthOpen": {
    "Value": true,
    "Confidence": 95.0912857055664
  },
  "Emotions": [
    {
      "Type": "HAPPY",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "SURPRISED",
      "Confidence": 6.25236177444458
    },
    {
      "Type": "FEAR",
      "Confidence": 5.875119686126709
    },
    {
      "Type": "SAD",
      "Confidence": 2.1482949256896973
    },
    {
      "Type": "CALM",
      "Confidence": 0.004457663279026747
    },
    {
      "Type": "DISGUSTED",
      "Confidence": 0.0024773466866463423
    },
    {
      "Type": "ANGRY",
      "Confidence": 0.0024096008855849504
    },
    {
      "Type": "CONFUSED",
      "Confidence": 0.0024058809503912926
    }
  ],
  "Landmarks": [
    {
      "Type": "EYE",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "MOUTH",
      "Confidence": 95.0912857055664
    },
    {
      "Type": "NOSE",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "JAW",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "FOREHEAD",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "CHEEK",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "CHIN",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "HAIR",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "EYEBROW",
      "Confidence": 99.98106384277344
    },
    {
      "Type": "EAR",
      "Confidence": 99.98106384277344
    }
  ]
}

```

Step 2: Compare faces

In this step, you will use the face comparison feature to see the detailed JSON response from comparing two different images that don't match.

1. Select Face comparison

Select **Face comparison** in the panel navigation on the left.

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Amazon Rekognition

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Facial analysis

Get a complete analysis of facial attributes, including confidence scores. [Learn more](#)



Choose a sample image



Use your own image

Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload

or drag and drop

▼ Results



looks like a face

99.9 %

appears to be male

99.9 %

age range

56 - 64 years old

smiling

96.2 %

appears to be happy

99.9 %

not wearing glasses

97.6 %

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2. Save second sample image

Open and save the second sample image for this tutorial [here](#).



3. Upload the reference face image

Click on the orange **Upload** button for the reference face and select the image you just saved.

The screenshot shows the Amazon Rekognition console's 'Face comparison' page. The left sidebar contains navigation links for Custom Labels, Demos, Video Demos, Metrics, and Additional Resources. The main content area is titled 'Face comparison' and includes a description: 'Compare faces to see how closely they match based on a similarity percentage. [Learn more](#)'. Below this, there are two columns: 'Reference face' and 'Comparison faces'. Each column has a large image placeholder, a 'Choose a sample image' section with two small image thumbnails, and a 'Use your own image' section with an 'Upload' button, a 'Go' button, and a text input for 'Use image URL'. The 'Reference face' section's 'Upload' button is highlighted with a red box. To the right of the image placeholders, there are three rows of comparison results. Each row shows two face images, an equals or not-equals sign, and a similarity percentage. The first row shows a high similarity of 99.9%, while the other two rows show a low similarity. Below the results, there are sections for 'Request' and 'Response'. The bottom of the page features a footer with 'Feedback', 'Looking for language selection? Find it in the new Unified Settings', copyright information, and links for 'Privacy', 'Terms', and 'Cookie preferences'.

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Amazon Rekognition ×

Face comparison

Compare faces to see how closely they match based on a similarity percentage. [Learn more](#)

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Reference face

Comparison faces

Choose a sample image

Choose a sample image

Use your own image

Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Use image URL Go

Use your own image

Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Use image URL Go

▼ Results

Similarity 99.9 %

Request

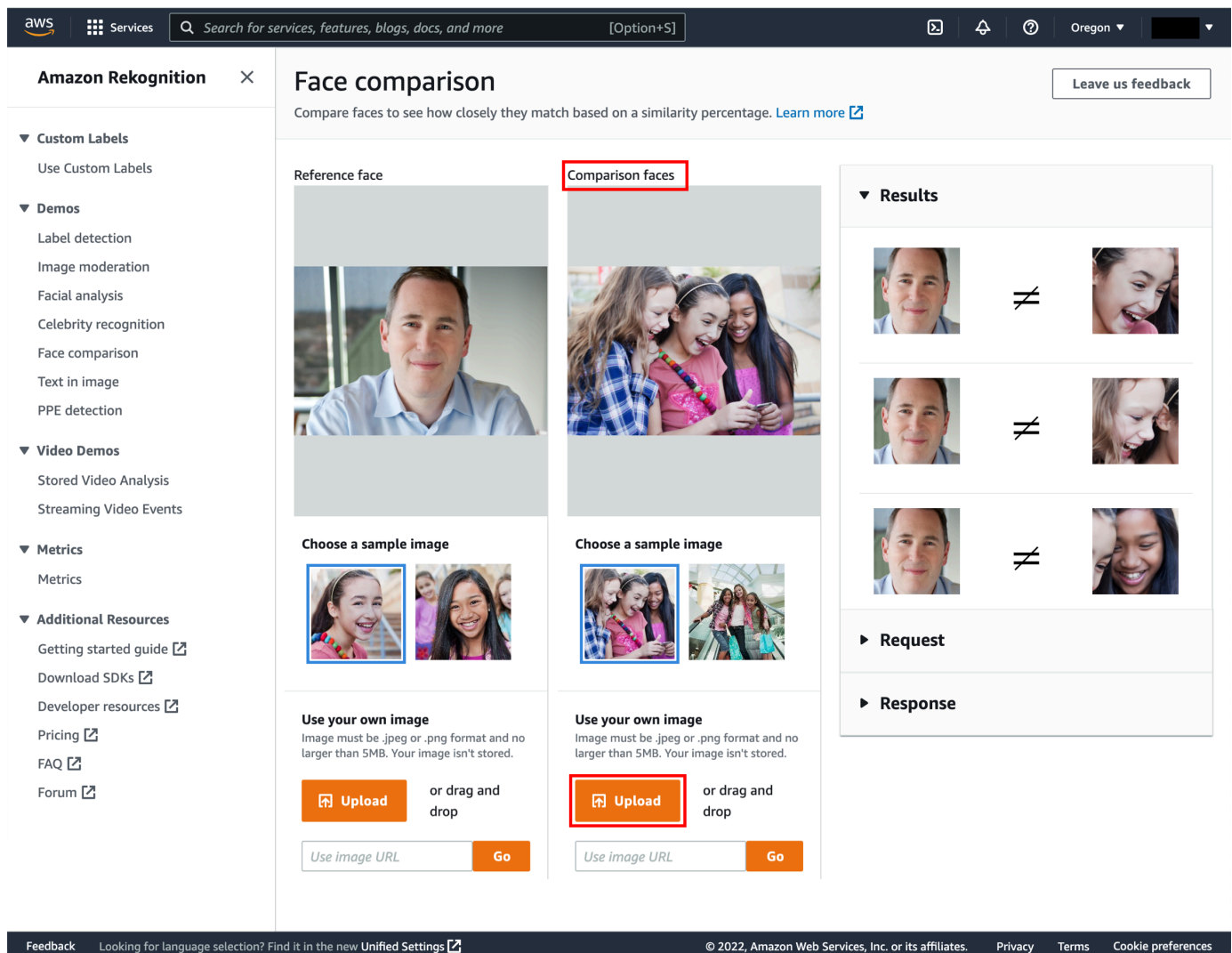
Response

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4. Select first reference image

Click on the orange **Upload** button for the comparison face and select our first sample image we used in step 2.



The screenshot displays the Amazon Rekognition console's 'Face comparison' interface. The left sidebar contains navigation links for Custom Labels, Demos, Video Demos, Metrics, and Additional Resources. The main content area is titled 'Face comparison' and includes a 'Leave us feedback' button. The interface is divided into three main sections: 'Reference face', 'Comparison faces', and 'Results'. The 'Reference face' section shows a sample image of a man. The 'Comparison faces' section shows a sample image of three women. The 'Results' section shows three comparison results, each with a reference face, a comparison face, and a 'not equal' symbol. The 'Upload' buttons in the 'Comparison faces' section are highlighted with a red box.

5. Review the Results

Notice that in **Results** dropdown you can see that our reference wasn't a match for any of the detected faces in our comparison faces image.

Amazon Rekognition ×

Face comparison [Leave us feedback](#)

Compare faces to see how closely they match based on a similarity percentage. [Learn more](#)

Reference face

Comparison faces

Results

Request

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6. Review the JSON results

Click on the **Response** dropdown to see the JSON results. Notice that the “Similarity” score for each of the detected faces never exceeds 1. The similarity score ranges from 1-100 and the threshold can be adjusted when using the API.

As a developer, comparing faces at scale can be used in applications to track persons of interest, create a face-based employee verification system, or provide a VIP experience to guests staying at a hospitality venue.

The screenshot shows the AWS IAM console interface. On the left, there is a navigation menu with categories like 'Image moderation', 'Facial analysis', 'Celebrity recognition', 'Face comparison', 'Text in image', and 'PPE detection'. Below these are sections for 'Video Demos', 'Metrics', and 'Additional Resources'. The main content area on the right is titled 'Request' and 'Response'. The 'Response' section is expanded, showing a JSON object. The 'FaceMatches' array contains one object with a 'Similarity' value of 0.5962035059928894, which is highlighted with a red box. The 'SourceImageFace' object contains bounding box information: 'Width': 0.3000960648059845, 'Height': 0.689637303352356, 'Left': 0.37668338418006897, 'Top': 0.07726003974676132. The 'Face' object contains bounding box information: 'Width': 0.10671369731426239, 'Height': 0.2065853774547577, 'Left': 0.6923362612724304, 'Top': 0.16253957152366638.

```
{
  "SourceImageFace": {
    "BoundingBox": {
      "Width": 0.3000960648059845,
      "Height": 0.689637303352356,
      "Left": 0.37668338418006897,
      "Top": 0.07726003974676132
    },
    "Confidence": 99.99944305419922
  },
  "FaceMatches": [
    {
      "Similarity": 0.5962035059928894,
      "Face": {
        "BoundingBox": {
          "Width":
0.10671369731426239,
          "Height":
0.2065853774547577,
          "Left": 0.6923362612724304,
          "Top": 0.16253957152366638
        }
      }
    }
  ]
}
```

Step 3: Compare faces (again)

In this step, you will use the face comparison feature to see the detailed JSON response from comparing two different images that have a match.

1. Save the sample image

Open and save the third and final sample image for this tutorial [here](#).



2. Upload the image

Click on the orange **Upload** button for the reference face and select the image you just saved.

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Amazon Rekognition Face comparison

Compare faces to see how closely they match based on a similarity percentage. [Learn more](#)

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Reference face



Choose a sample image



Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Use image URL **Go**

Comparison faces



Choose a sample image

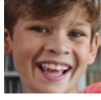


Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

Upload or drag and drop

Use image URL **Go**

▼ **Results**

	≠	
	≠	
	≠	
	≠	
	≠	
	≠	

► **Request**

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3. Review the Results

Notice that the reference face that was compared to our other photo detected a 99% similarity score and detected that all other faces were not a match.

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Amazon Rekognition Face comparison

Compare faces to see how closely they match based on a similarity percentage. [Learn more](#)

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Getting started guide

Reference face



Choose a sample image




Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

 Upload or drag and drop



Comparison faces



Choose a sample image




Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

 Upload or drag and drop



▼ Results

	=	
Similarity 99.9 %		
	≠	
	≠	
	≠	
	≠	
	≠	

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4. Review the JSON results

Click on the **Response** dropdown to see the details of each comparison.

The screenshot shows the AWS Management Console for Amazon Rekognition. The left sidebar contains a navigation menu with categories like Image moderation, Facial analysis, and Video Demos. The main content area displays a JSON response from the Rekognition API. The response is a JSON object with the following structure:

```
{
  "SourceImageFace": {
    "BoundingBox": {
      "Width": 0.14882461726665497,
      "Height": 0.25058576464653015,
      "Left": 0.5901865363121033,
      "Top": 0.19493792951107025
    },
    "Confidence": 99.99374389648438
  },
  "FaceMatches": [
    {
      "Similarity": 99.99653625488281,
      "Face": {
        "BoundingBox": {
          "Width": 0.07834743708372116,
          "Height": 0.16656093299388885,
          "Left": 0.6131072044372559,
          "Top": 0.10988158732652664
        },
        "Confidence": 99.97862243652344,
        "Landmarks": [

```

The response shows a source image face with a bounding box and confidence, and a list of face matches. The similarity and confidence values for the first match are highlighted with red boxes.

Conclusion

You have learned how to use the console to analyze and compare faces. You can also perform this feature using the API so you can operate at scale. Use Amazon Rekognition when you need to perform facial analysis at scale without worrying about infrastructure or training a model for identifying persons of interest, cataloging a digital library, creating a face-based employee verification system, or performing sentiment analysis.