

Face Recognition Service

Product Introduction

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1 What Is FRS?

Face Recognition Service (FRS) is an intelligent service that uses computers to process, analyze, and understand facial images based on human facial features. It provides services through open Application Programming Interfaces (APIs). You can obtain the face recognition results by accessing and calling APIs in real time. It recognizes and compares faces automatically and provides you with the similarity degrees, thereby improving service efficiency.

Currently, FRS provides the following sub-services:

- [Face Detection](#)
- [Face Verification](#)
- [Face Retrieval](#)
- [Face LiveDetect](#)

Face Detection

Face Detection accurately locates faces in an image and identifies the size of each face. With this sub-service, you can detect front and side faces with different tilts in the image.

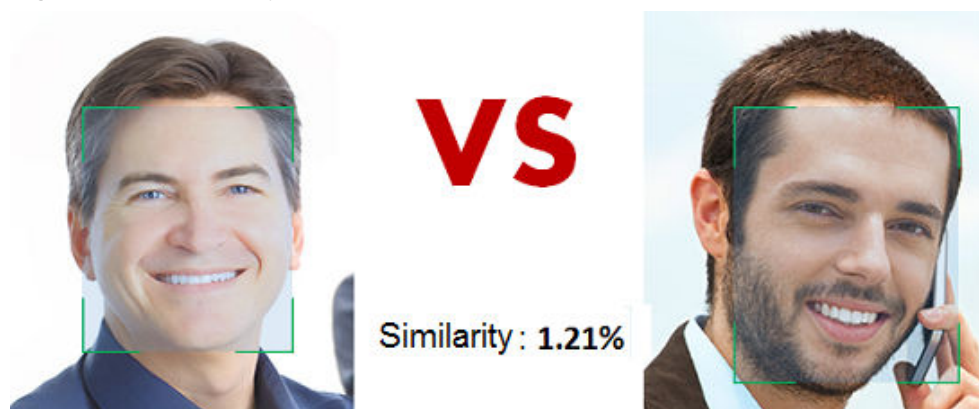
Figure 1-1 An example of Face Detection



Face Verification

Face Verification returns the similarity degree between two faces in two images by comparing the facial features. If the two images contain multiple faces, the system compares the similarity between the largest faces in the two images.

Figure 1-2 An example of Face Verification

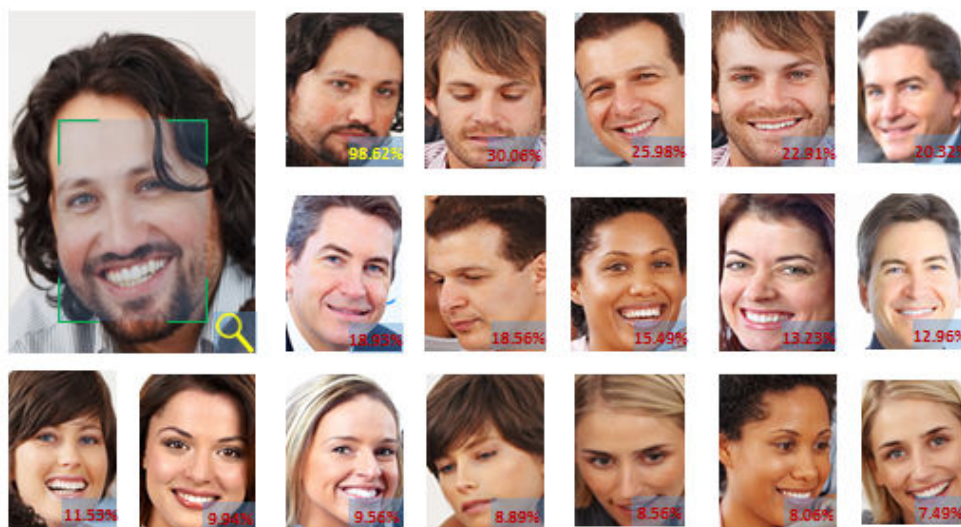


Face Retrieval

Face Retrieval provides APIs for operating face sets. You can use specific APIs to create a face set, add facial images to the face set, search for N facial images that are most similar to the input one, delete facial features you no longer use from the face set, and delete the face set you created.

Face Retrieval is perfect for enterprise and residential security management of public security. However, it cannot be used for preventing photo recapture because it cannot distinguish fake photos and real photos.

Figure 1-3 An example of Face Retrieval



Face LiveDetect

Face LiveDetect determines whether a person in a video is alive by checking whether the person's actions in the video are consistent with those in the input action list. If multiple faces appear, the largest face is selected.

2 Application Scenarios

Identity Verification

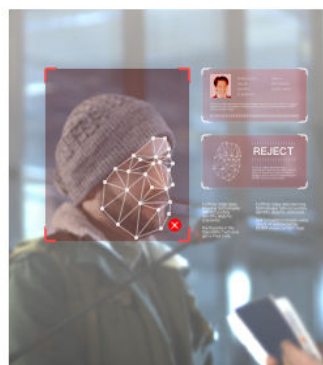
The Face Detection and Verification functions can be used for identity verification in scenarios such as airports and customs where consistency between a certificate and a person must be checked.

Figure 2-1 Identity verification

Facial verification succeeded



Facial verification failed



e-Attendance

The Face Detection and Verification functions allow enterprise customers to implement e-attendance for employees.

Customer Attribute Analysis

Customer attribute analysis is of large value to shopping malls. Face detection and retrieval technologies help achieve precise marketing.

3 Billing

3.1 Billing

Billing Items

Table 3-1 Billing items

Item	Description
Number of FRS API calls	Fees charged when you call FRS APIs. In the pay-per use billing mode, you are billed based on the number FRS API calls.

Billing Mode

- Pay-per-use
You are billed based on the total number of successful FRS API calls in a calendar month. After a calendar month ends, the number of API calls is cleared.
For details about pricing, contact [customer service](#).
All APIs under **Facial Image Library Management** are free of charge. All APIs under **Facial Resource Management** are free of charge except for those for adding and deleting faces.

 **NOTE**

- An API call is counted only when it succeeds. Remaining free API calls will be cleared at the end of the month.
- Billing rule: You will be billed based on the number of API calls. The API calls are accumulated by calendar month and are cleared at the end of each month.
- Each user can use 10 facial image libraries free of charge, with each containing a maximum of 100,000 facial features.
- Default concurrency: 1 QPS for Action LiveDetect and 10 QPS for other APIs. If the number of concurrent requests exceeds the default value, "FRS.0033" is displayed, indicating that the upper limit of traffic for handling these requests has been reached.

Renewal

For details about renewal, see [Renewal Management](#).

3.2 Expiration and Overdue Payment

Retention Period

You will be granted a grace period if your account is in arrears due to insufficient balance for fee deductions or your bills overdue. If the outstanding amount is not paid off when the grace period ends, your resources will enter a retention period, during which the resources become unavailable. If the outstanding amount is still not paid off when the retention period ends, the stored data will be deleted and the cloud service resources will be released.

Overdue Payment

If your account is in arrears, some operations will be restricted. You are advised to top up your account as soon as possible. The restricted operations are as follows:

- Subscribing to FRS
- Calling pay-per-use APIs

To ensure normal service usage, top up your account in [Billing Center](#) of the Huawei Cloud console after receiving an arrears notification.

Arrears Reasons

Arrears typically occur in the following scenarios:

- The master account did not subscribe to FRS, but an IAM user under the master account had the permission to subscribe and did so independently, resulting in charges incurred by calling FRS APIs.
- If the pay-per-use billing mode is changed to a package and the package has not taken effect, calling APIs during this period will be billed based on a pay-per-use basis.
- The API usage exceeds the package quota.
- You call pay-per-use APIs after the QPS exceeds the concurrency limit of the QPS package you purchased.

- You call an API in a region other than the region where the package you purchased.
- You call an API other than the one you purchased.

4 Related Services

IAM

FRS uses Identity and Access Management (IAM) for authentication and authorization.

OBS

FRS allows users to read facial images from Object Storage Service (OBS).

CTS

FRS uses Cloud Trace Service (CTS) to record FRS operation events for future querying, auditing, and backtracking. [Table 4-1](#) lists the operation events. For more information about CTS, see the [Cloud Trace Service User Guide](#).

Table 4-1 FRS operations supported by CTS

Operation	Resource Type	Event
Creating a facial image library	faceset	createFaceSet
Deleting a facial image library	faceset	deleteFaceSet

Cloud Eye

FRS uses Cloud Eye to monitor the number of API calls and latency of its sub-services. [Table 4-2](#) shows the details. For more information about Cloud Eye, see the [Cloud Eye User Guide](#).

Table 4-2 Monitoring metrics of FRS

Metric	Description	Value Range	Monitored Object
Successful Calls of Service	Number of successful API calls The unit is times .	≥ 0 times	FRS
Failed Calls of Service	Number of failed API calls due to 5xx errors The unit is times .	≥ 0 times	FRS
Average Latency	Average latency of APIs The unit is ms .	≥ 0 ms	FRS
Face Counts	Number of faces in a facial image library Do not start the name of a facial image library with an underscore (_). Otherwise, the Cloud Eye service cannot collect the number of faces. The unit is count .	≥ 0 counts	FRS

5 How to Use FRS

You can access FRS on a web-based service management platform, that is, the management console, or using HTTPS-based APIs. FRS provides services through open Application Programming Interfaces (APIs). To use it, you need to integrate FRS to a third-party system.

Enable FRS on the management console and then call APIs to use it on the third-party system. The process is as follows:

1. Apply for the service.

Before using the service, log in to the [FRS management console](#) to enable the service. You only need to enable the service once.

 **NOTE**

To operate OBS data when using FRS, authorize FRS to access OBS first. On the page for enabling services, click **Service Authorization** in the upper right corner to complete OBS authorization.

2. Obtain request authentication.

You can use either of the following authentication methods when calling APIs. For details about the authentication, see [Authentication](#).

- Token authentication: Requests are authenticated using tokens.
- AK/SK authentication: Encrypts API calling requests using the access key ID (AK) and secret access key (SK). The AK/SK authentication is more secure.

3. Call an API.

FRS provides services as APIs. For details, see the [Face Recognition Service API Reference](#).

4. View service usage.

You can view the number of successful service API calls on the [FRS management console](#).

6 Restrictions and Limitations

Due to various factors such as technology and cost, FRS has some restrictions. The system-wide restrictions affect all sub-services. In addition to system-wide restrictions, sub-services have their independent restrictions.

System-Wide Restrictions

- Only images in JPG, PNG, JPEG, or BMP format can be recognized.
- Each user can use 10 facial image libraries. Each library contains a maximum of 100,000 facial features.
- Use standard JSON format in the body of the **application/json** request.
- Do not use carriage return characters in Base64 code.
- The system does not save images or videos of users.

Face Detection/Verification/Retrieval

- The total size of the two images input for face verification is **less than 8 MB**.
- The image size must be **less than 8 MB**. If the image size is too large, the image transmission will take a long time. It is recommended that the image size be **less than 1 MB**.
- The image resolution must be **less than 4096 x 2160**. The face resolution in an image must be **greater than 80 x 80**. It is recommended that the face resolution be **greater than 120 x 120**.
- To ensure the recognition effect, facial images need to meet the following requirements:
 - a. The illumination should be greater than 200 lux and there is no light reflection or shadow caused by strong light.
 - b. The overall image is clear without obvious motion blur and the face in it is not blocked.
 - c. The side face angle does not exceed 30°, and the tilt angle and horizontal angle do not exceed 15°. The face in an image must be a vertically placed front face.

Face LiveDetect

- Currently, only video files and Base64-encoded videos can be detected. User clients need to obtain the video streams, save them as files, and then call the LiveDetect API.
- The size of a video file cannot exceed 8 MB. It is recommended that the video file be compressed to **200 KB to 2 MB** on the client.
- The video duration must be **1 to 15** seconds.
- The recommended frame rate is **10 fps to 30 fps**.
- The encapsulation format can be MP4, AVI, FLV, WEBM, ASF, or MOV.
- The video encoding format can be H.261, H.263, H.264, HEVC, VC-1, VP8, VP9, or WMV3.

7 Monitoring

7.1 FRS Monitoring Metrics

Function

This section describes metrics reported by FRS to Cloud Eye as well as their namespaces, list, and dimensions. You can use the management console or [APIs](#) provided by Cloud Eye to query the metric and alarm information generated for FRS.

Namespace

SYS.FRS

Monitoring Metrics

Table 7-1 FRS metrics

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Period (Original Metric)
api_calls	Successful Calls of Service	Number of successful API calls Unit: Times	≥ 0 times	API	1 minute
error_4xx	Failed Calls Due to 4xx Errors	Number of failed API calls due to 4xx errors Unit: Times	≥ 0 times	API	1 minute

Metric ID	Metric	Description	Value Range	Monitored Object	Monitoring Period (Original Metric)
error_5xx	Failed Calls Due to 5xx Errors	Number of failed API calls due to 5xx errors Unit: Times	≥ 0 times	API	1 minute
average_latency	Average Latency	Average latency of APIs Unit: ms	≥ 0 ms	API	1 minute
face_number	Face Counts	Number of faces in a facial image library Unit: Count	≥ 0 counts	Facial image library	1 minute

Dimensions

Key	Value
call_of_api	API
face_set	Facial image library

7.2 Viewing Monitoring Metrics

1. Log in to the [FRS management console](#).
2. In the navigation pane, choose **Service List > Management & Deployment > Cloud Eye**.
3. In the navigation pane on the left, choose **Cloud Service Monitoring** and select **Face Recognition Service**.
4. Click **View Metric** in the **Operation** column.
5. In the monitoring area, you can select a duration to view the monitoring data. You can view the monitoring data of FRS in last 1 hour, last 3 hours, last 12 hours, last 24 hours, and last 7 days based on your requirements.