

Image Classification, Identification and Thumbnail Generation



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Overview



Accessing the API

Thumbnails and ROIs

Tagging and Categorizing Images

Identifying Image Types and Quality

Domain Specific Content

Generating Descriptions

Perceiving Color Schemes

Detecting Human Faces



Accessing the API



- Subscribe to the Computer Vision API**
- Obtain the subscription keys**
- Choose a client library or SDK**
- Invoke the API using the library**



```
curl -v -X POST  
"https://westcentralus.api.cognitive.microsoft.com/vision/v  
1.0/analyze?details={string}&language=en"  
  
-H "Content-Type: application/json"  
  
-H "Ocp-Apim-Subscription-Key: {subscription key}"  
  
--data-ascii "{body}"
```

cURL Request Example

- URL
- Ocp-Apim-Subscription-Key
- details={string}
- {body}



```
{  
  "tags": [  
    {  
      "name": "person",  
      "confidence": 0.98979085683822632  
    }  
  ]  
}
```

Response Example

Tags Array

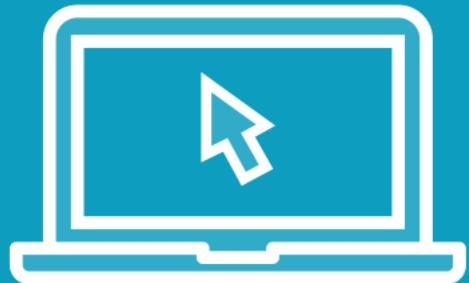
- Name
- Confidence



Why Use a Library?



Demo



Accessing the API using C#
Basic image analysis



Thumbnail

It is a small representation of a full-size image.



Thumbnail Features



- Great for various devices**
- Provide different user experiences**
- Generated using smart cropping**
- Based on a region of interest (ROI)**



Region of Interest (ROI)



Region of interest



How a Thumbnail Is Created

Remove distracting elements

Recognizes the ROI

Crops based on the ROI

Changes aspect ratio



A thumbnail's aspect ratio
may differ from the aspect
ratio of the original image.



API Methods - Thumbnail Generation





Locations

US

- East US, East US 2, West US, West US 2
- West Central US, South Central US

Europe

- West Europe, North Europe

APAC

- Southeast Asia, East Asia, Australia East

LATAM

- Brazil South



Methods – Thumbnail Generation



Generate thumbnail



Request headers

Content-Type (optional) -> Media type of the body sent to the API

Ocp-Apim-Subscription-Key -> Cognitive Services key

Request body

- Input passed within the POST body. Raw binary image or image URL.
- Supported formats: JPEG, PNG, GIF, BMP.
- Less than 4MB.
- Dimensions should be greater than 50 x 50.



POST

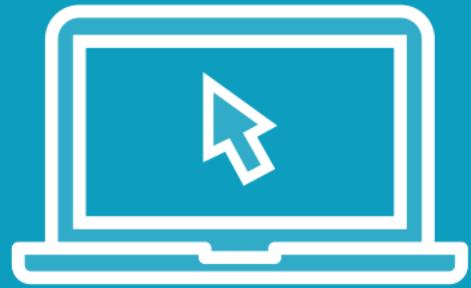
[https://\[location\].api.cognitive.microsoft.com/vision/v1.0/generateThumbnail\[?width\]\[&height\]\[&smartCropping\]](https://[location].api.cognitive.microsoft.com/vision/v1.0/generateThumbnail[?width][&height][&smartCropping])

Generate thumbnail

- **width** - Value between 1 and 1024 - Minimum value of 50 is recommended
- **height** - Value between 1 and 1024 - Minimum value of 50 is recommended
- **smartCropping** (optional) - Flag for enabling smart cropping



Demo



Quick thumbnail creation



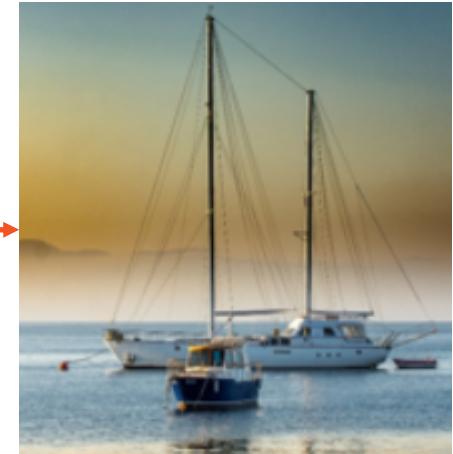
Use Case: Happy Pics



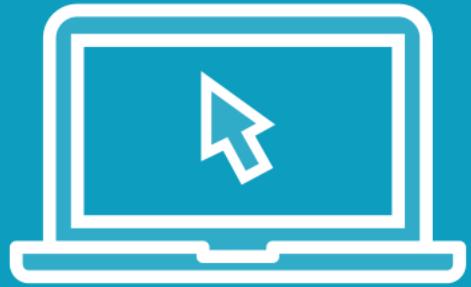
Before the Computer Vision API



Using the Computer Vision API



Demo



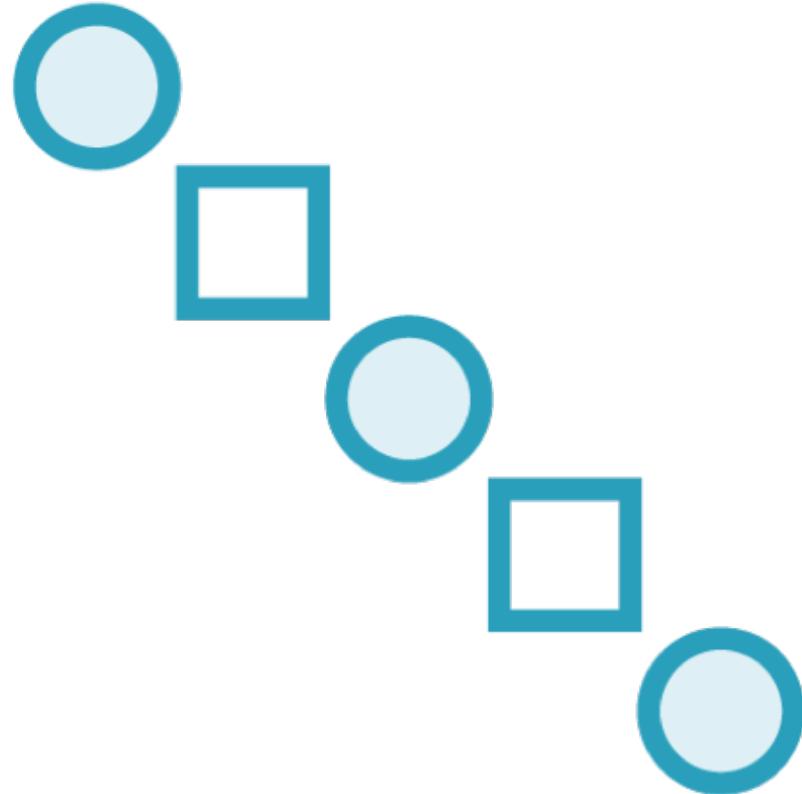
Smart thumbnail generation



Tagging Images



Image Tagging Functionality



Tags based on >2000 recognizable objects

Image description based content tags

Tagging includes subject & background



Image Tagging Functionality



Returned Json

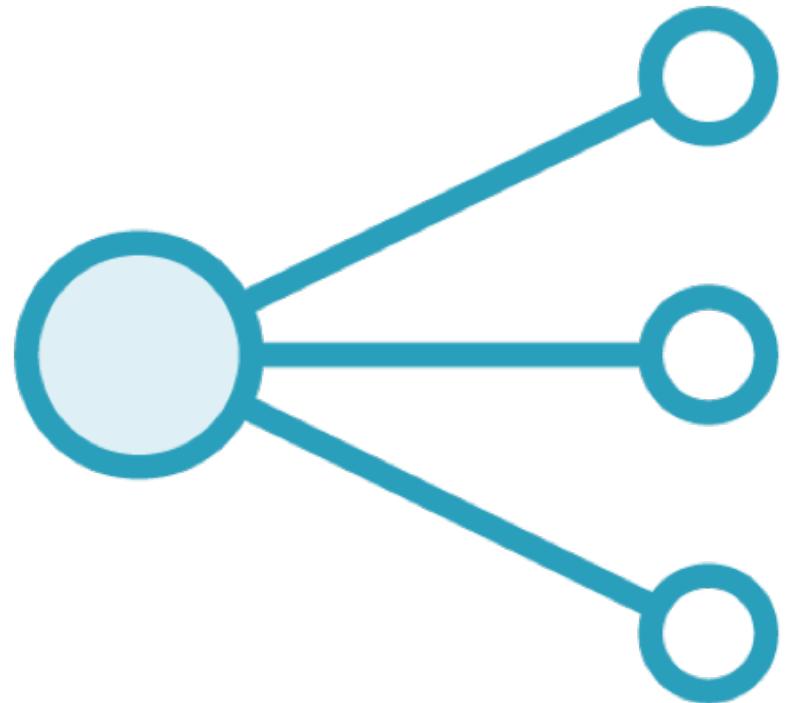
```
{
  "tags": [
    {
      "name": "grass",
      "confidence": 0.999999761581421
    },
    {
      "name": "outdoor",
      "confidence": 0.999970674514771
    },
    {
      "name": "sky",
      "confidence": 0.99289751052856
    },
    {
      "name": "building",
      "confidence": 0.996463239192963
    },
    {
      "name": "house",
      "confidence": 0.992798030376434
    }
  ]
}
```



Categorizing Images



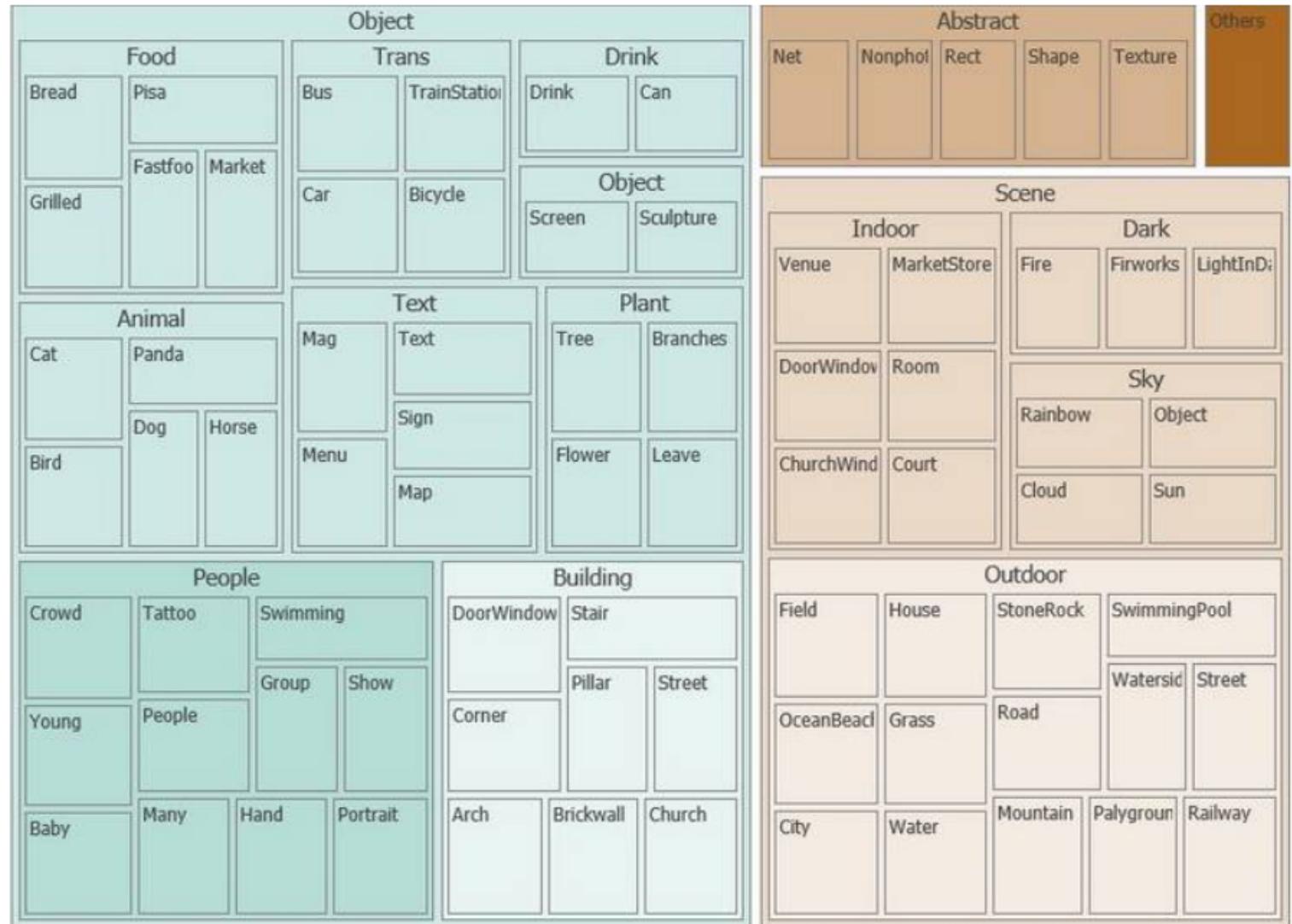
Image Categorization Functionality



Taxonomy based categories
Hereditary hierarchies
English based categories



The 86-category concept



Categorizing Images Functionality



People



Plant_Tree



Trans_Car



Identifying Image Types & Quality



Image Types & Quality Functionality



Boolean flag for color type

Boolean flag for line drawing

Boolean flag for clip-art type

Boolean flag for image quality



Clip-art Type



Value	Meaning
0	Non-clip-art
1	ambiguous
2	normal-clip-art
3	good-clip-art



Line Drawing Type



True



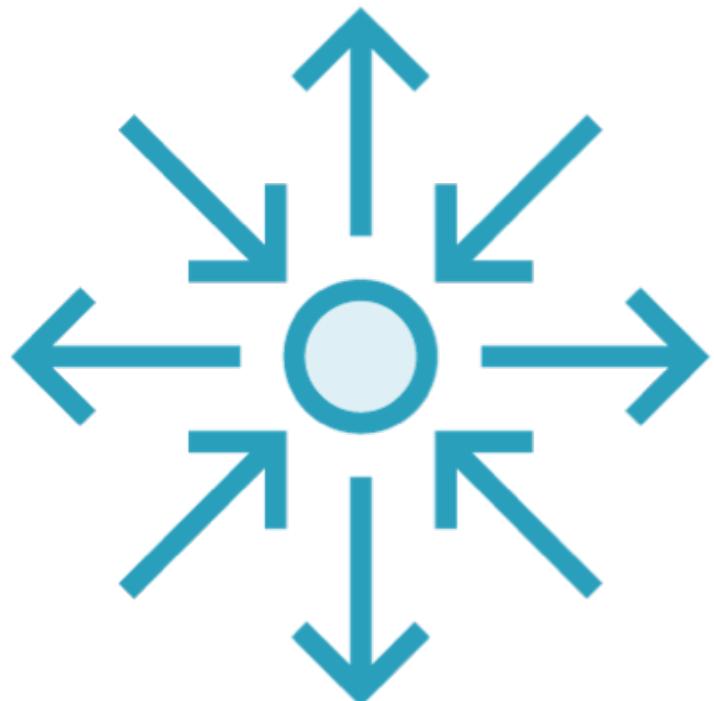
False



Domain Specific Content



Domain Specific Content



Refine the 86 category taxonomy
Celebrity & landmark recognition
Scoped Analysis
Enhanced Analysis



Scoped Analysis



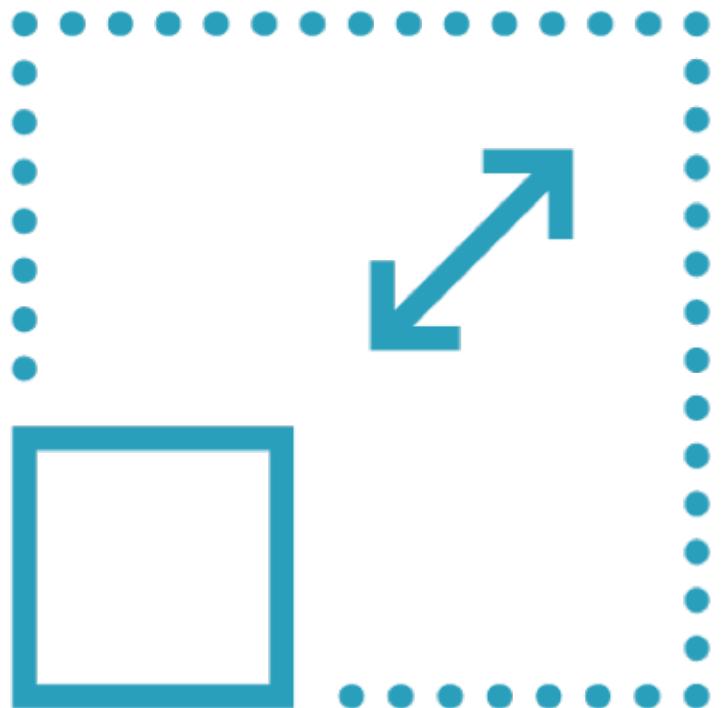
Analyses a chosen model

Specify the model's name

Get relevant information for that model



Enhanced Analysis



Refine the 86 category taxonomy

Generic image analysis

The 86 category classifier is called first

A second pass of classifier follows

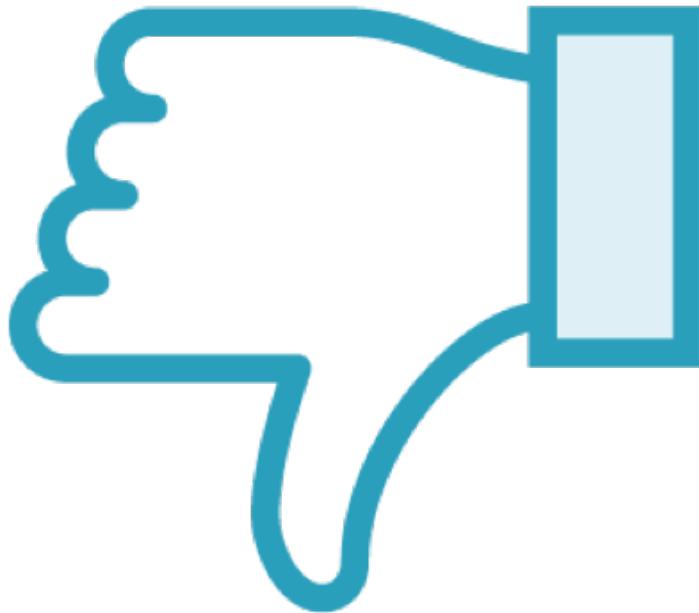
Example: details=all



Flagging Adult Content



Flagging Adult Content



Detection of adult material

Restricts images with sexual content

Filter can be set on a sliding scale

Generating Descriptions



Generating Descriptions



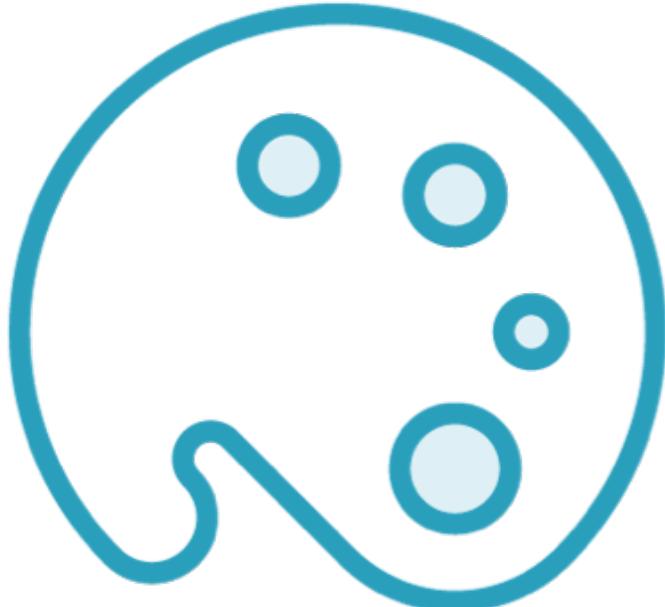
- Summarizes what is found in the image**
- Generated based on objects identified**
- Contain a confidence score**
- Ordered from highest to lowest score**



Perceiving Color Schemes



Perceiving Color Schemes



Different contexts:

- foreground, background & whole

12 dominant accent colors

Colors may be returned in hexadecimal



Dominant Accent Colors

Black

Blue

Brown

Gray

Green

Orange

Pink

Purple

Red

Teal

White

Yellow



Accent Colors



Most eye-popping color
Mix of dominant color and saturation
Hexadecimal value returned



Black & White



**Bitonal or grayscale detection
In this case, true is returned**



Detecting Human Faces



Detecting Human Faces



Detection of human faces

Face coordinates

Gender & age

Multiple faces can be detected



API Methods - Image Classification & Identification



Methods - Image Classification & Identification



Analyze image

Describe image

Tag image

List specific domain models

Recognize domain specific content



POST

`https://[location].api.cognitive.microsoft.com/vision/v1.0/
analyze[?visualFeatures][&details][&language]`

Analyze

- **visualFeatures** (optional) - **Tags, Description, Faces, ImageType, Color, Adult**
- **details** (optional) - **Celebrities, Landmarks**
- **language** (optional) - **en** (English - default), **zh** (Simplified Chinese)



POST

`https://[location].api.cognitive.microsoft.com/vision/v1.0/
describe[?maxCandidates]`

Describe

- **maxCandidates** (optional)



POST

`https://[location].api.cognitive.microsoft.com/vision/v1.0/
tag`

Tag

- No parameters



GET

`https://[location].api.cognitive.microsoft.com/vision/v1.0/
models`

List domain specific models

- No parameters



POST

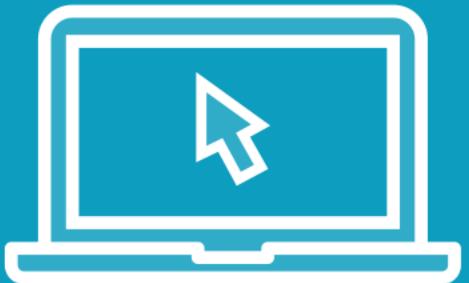
`https://[location].api.cognitive.microsoft.com/vision/v1.0/
models/{model}/analyze`

Recognize domain specific content

- **model** - The domain-specific content to recognize



Demo



Smart image analysis

Perform image classification



Summary



Image Classification & Identification

- Access the API
- Tagging Images
- Categorizing Images
- Identifying Image Types & Quality
- Domain Specific Content
- Flagging Adult Content
- Generating Descriptions
- Perceiving Color Schemes
- Detecting Human Faces

Thumbnails & ROIs

- HappyPics
- Smart Thumbnail Generation

