

The background features a large white circle in the center. To the left of the circle is a light blue vertical band, and to the right is a light pink vertical band. A large, dark blue shape, resembling a stylized arch or a wide smile, is positioned at the bottom, partially overlapping the white circle.

IMAGE RECOGNITION WITH IBM CLOUD VISUAL RECOGNITION

AGENDA

Introduction

Create a Visual Recognition service

Implement Image Classification

Generate captions using Natural Language Generation

Integrating Image Classification and Caption Generation

Summary

Image Recognition with IBM Cloud Visual Recognition

CREATE A VISUAL RECOGNITION SERVICE

Create a Visual Recognition Service:

Create a new Watson Visual Recognition service instance on IBM Cloud.

Obtain the API key and endpoint provided by IBM Watson Visual Recognition.

Create a Watson Studio project where you can manage your data, collaborate with others, and create machine learning models.

IMPLEMENT IMAGE CLASSIFICATION

We are utilizing IBM Watson SDK for Python to interact with the Visual Recognition API. First, we install the required Python SDK

To install python SDK:

```
pip install ibm-Watson
```

Prepare Your Data:

Prepare your image data and store it in a suitable format, such as a CSV file with URLs pointing to the images.

Train a Custom Model:

Utilize Watson Machine Learning to train a custom image classification model using your prepared data. You might use popular deep learning frameworks like TensorFlow or PyTorch to build your model, and then deploy it using Watson Machine Learning.

Image Recognition with IBM Cloud Visual Recognition

Then, classify images using the Watson Visual Recognition service:

```
from ibm_watson import VisualRecognitionV3
from ibm_cloud_sdk_core.authenticators import IAMAuthenticator
```

```
API_KEY = '1hu9Y61O_OY3Wg-bVAwIYEZ8bTb9Gd2pcwK2ZMwbVYxX'
ENDPOINT = 'https://api.cdp.ibmcloud.com '
```

```
authenticator = IAMAuthenticator(1hu9Y61O_OY3Wg-bVAwIYEZ8bTb9Gd2pcwK2ZMwbVYxX)
visual_recognition = VisualRecognitionV3(
    version='2023-03-19',
    authenticator=authenticator
)
```

```
def classify_image(https://images.pexels.com/photos/96417/pexels-photo-96417.jpeg?cs=srgb&dl=pexels-francesco-ungaro-96417.jpg&fm=jpg):
    classes = visual_recognition.classify(url= https://images.pexels.com/photos/96417/pexels-photo-96417.jpeg?cs=srgb&dl=pexels-francesco-ungaro-96417.jpg&fm=jpg).get_result()
    return classes
```

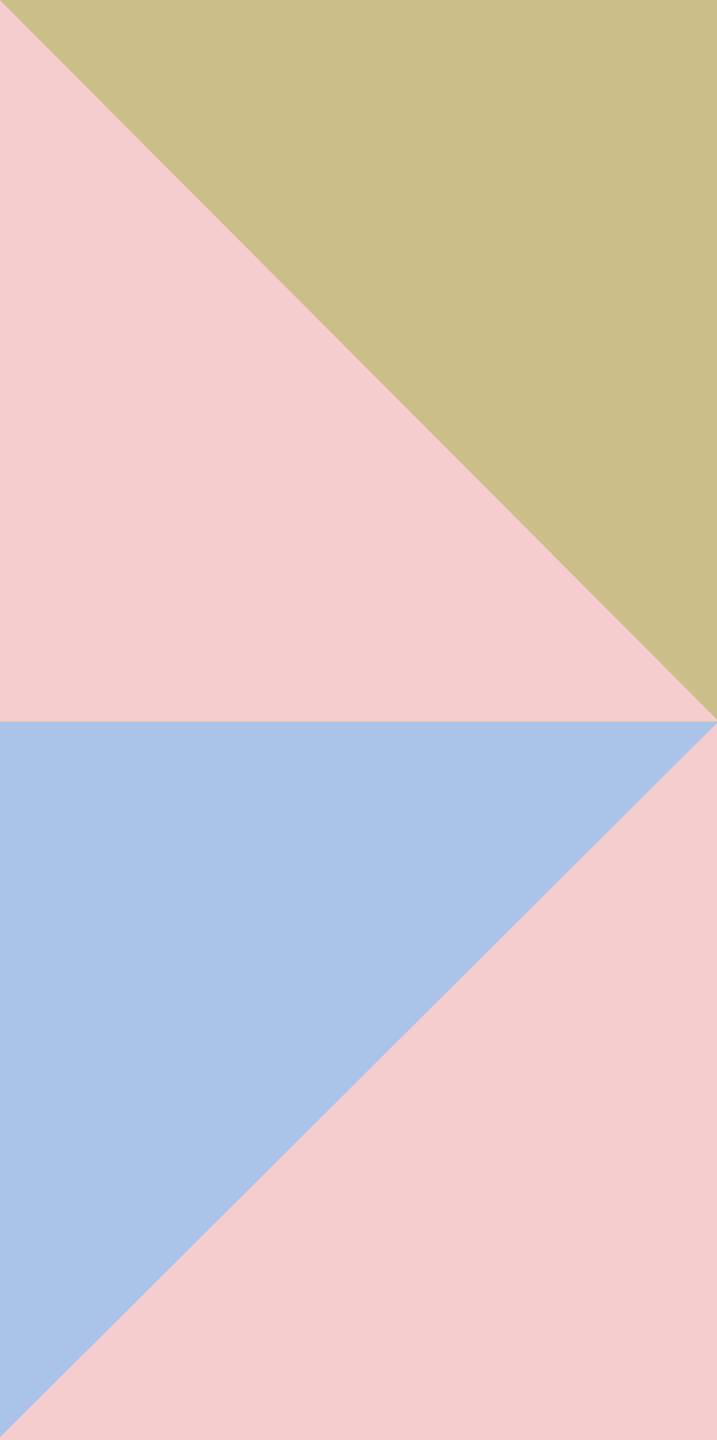


Image Recognition with IBM Cloud Visual Recognition

GENERATE CAPTIONS USING NATURAL LANGUAGE GENERATION

We use libraries like NLTK or spaCy for natural language processing, or use specialized APIs like OpenAI's GPT-3.5 for generating captions.

```
def generate_caption(image_classes):  
    caption = generate_caption_using_gpt(image_classes)  
    return caption
```

Integrate Watson Natural Language Understanding:

Utilize Watson Natural Language Understanding to analyze the content of the images and extract relevant information. You can extract entities, concepts, emotions, and other metadata from the image content.

Generate Captions:

Based on the extracted metadata, you can use natural language generation techniques to create captions for the recognized images.

Image Recognition with IBM Cloud Visual Recognition

INTEGRATING IMAGE CLASSIFICATION AND CAPTION GENERATION

```
image_url = ' https://images.pexels.com/photos/96417/pexels-photo-96417.jpeg?cs=srgb&dl=pexels-francesco-ungaro-96417.jpg&fm=jpg '
```

Step 1: Classify the image using IBM Cloud Visual Recognition API

```
image_classes = classify_image(https://images.pexels.com/photos/96417/pexels-photo-96417.jpeg?cs=srgb&dl=pexels-francesco-ungaro-96417.jpg&fm=jpg)
```

Step 2: Generate captions based on the classified image

```
image_caption = generate_caption(image_classes)
```

Print or use the generated caption

```
print("Generated Caption:", image_caption)
```

Image Recognition with IBM Cloud Visual Recognition

CONCLUSION

Thus the image recognition system is builded by integrating IBM Cloud Visual Recognition and AI-generated captions.

Thus we implemented the image classification process using the IBM Cloud Visual Recognition API.

Thus we used natural language generation to create captions for the recognized images.