

Computer Vision Workshop

Lab 1 : Using Visual Recognition with UI

Objective

This lab will teach you how to build an image classifier using IBM's Visual Recognition service which uses machine learning to determine what is contained in an image. In these labs, we will start using out of the bow Watson service to detect faces, food on images of your choice, then upcoming lab we will create our own custom classifier.

The first part of this lab will show you how to create a Visual Recognition Service, and use its tooling to test Watson provided models.

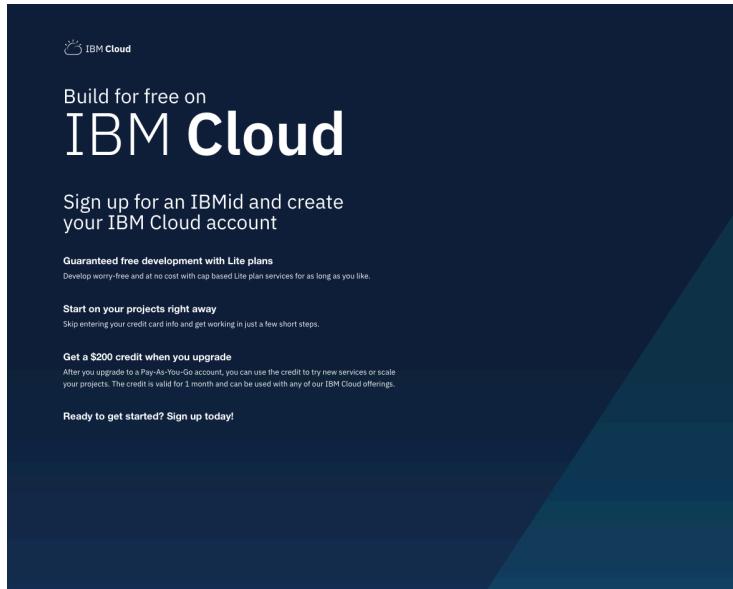
Create an IBM Cloud Account

Go to IBM Cloud site on <https://console.bluemix.net> (former console) or <https://cloud.ibm.com> (new console) and click on **Create a free account**

The screenshot shows the IBM Cloud login page. At the top left, there is a URL bar with a lock icon and the text "https://cloud.ibm.com/login". The main title "Welcome to IBM Cloud" is centered in large white font. Below it, a subtitle reads "Start building immediately using 190+ unique services.". A prominent "Create an IBM Cloud account" button is located at the bottom left of the main content area. To the right of the button, a promotional message states "Get a \$200 credit when you upgrade" and provides a brief description of the offer. At the very bottom, there is a "Learn more:" link followed by "Pricing Catalog Docs Status".

On the next screen, enter your email (or alias), Last Name, First Name and Password.

IMPORTANT : Specify **United States** as country to be able to use beta features of IBM Cloud.



Already have an IBM Cloud account? [Log In](#)

Create an IBM Cloud Account

Email*

First Name*

Last Name*

Country or Region* United Kingdom

Password*

IBM may use my contact data to keep me informed of products, services and offerings:
 by email by telephone

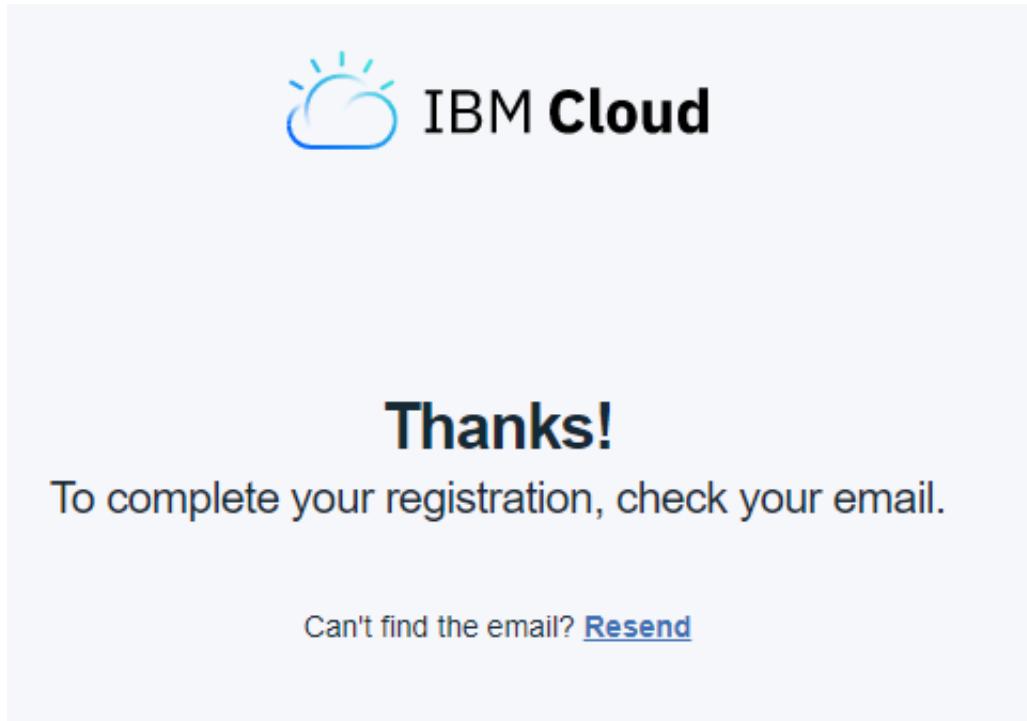
You can withdraw your marketing consent at any time by sending an email to netsupo@us.ibm.com. Also you may unsubscribe from receiving marketing emails by clicking the unsubscribe link in each such email.

More information on our processing can be found in the [IBM Privacy Statement](#). By submitting this form, I acknowledge that I have read and understand the IBM Privacy Statement.

I accept the product [Terms and Conditions](#) of this registration form.

[Create Account](#)

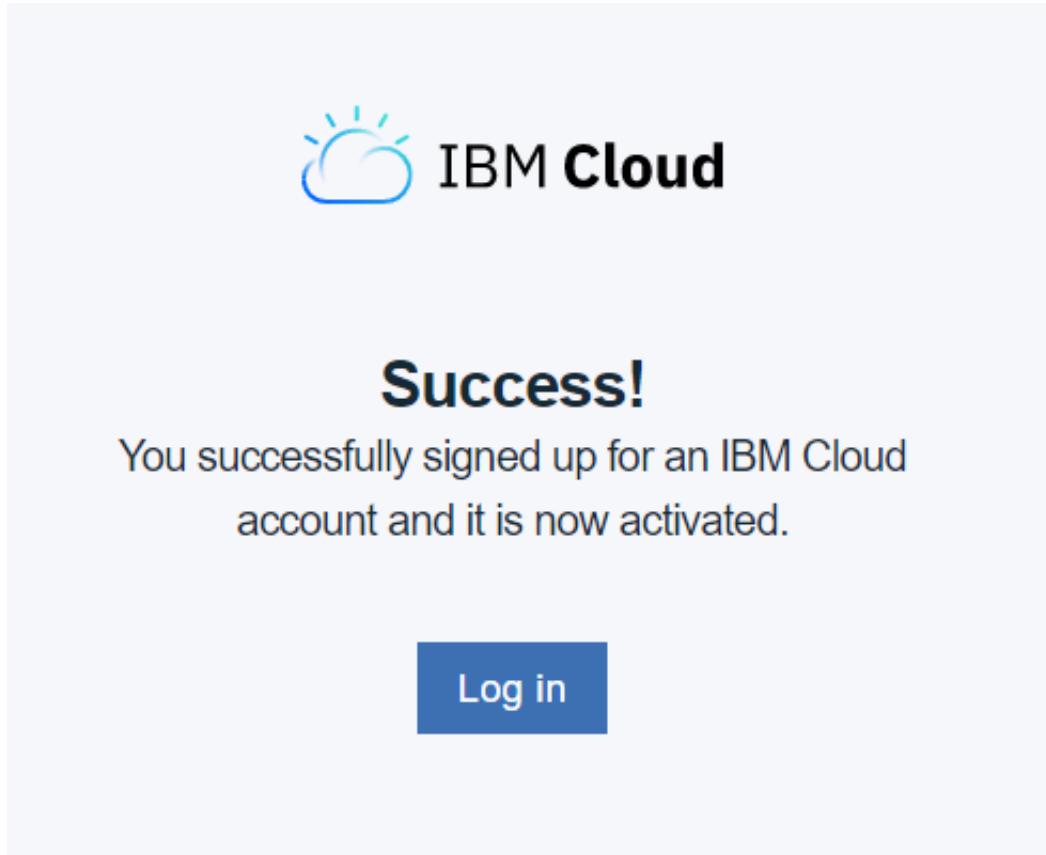
Then click on **Create Account**



A confirmation email should be sent shortly, entitled

Action required: Confirm your IBM Cloud account. Follow the instructions in this message to validate your account on IBM Cloud.

After having confirmed the creation of the account, proceed to login



Create the service on the IBM Cloud

1. Login to the IBM Cloud : <https://console.bluemix.net> or <https://cloud.ibm.com>
2. Go to the IBM Cloud **Catalog** and select **AI** category.

The image shows the IBM Cloud Catalog page with the "AI" category selected. A red circle with the number "1" highlights the Catalog tab in the top navigation bar. A red circle with the number "2" highlights the "AI" category in the sidebar. A red circle with the number "3" highlights the "Watson Studio" service card. The sidebar on the left lists various service categories, and the main area displays a grid of AI services with their descriptions and icons.

3. Then click the **Watson Studio** tile, then choose a name for your service (e.g. My-Studio), then click the **Create** button.

Watson Studio

Service name: Watson Studio-Pizza

Choose a region/location to deploy in: US South

Select a resource group: default

Features

- Use what you know, learn what you don't
- Be a founding member
- Power on demand
- Collaborate for better outcomes

Images

Click an image to enlarge and view screen captures, slides, or videos. Screen caps show the user interface for the service after it has been provisioned.

Need Help? Contact IBM Cloud Support

Estimate Monthly Cost Cost Calculator

Create

- Watson Studio is the tool for building AI models in a collaborative fashion so you can provide a more democratic training process that reduces AI biases.

Watson Studio-Pizza

Location: United Kingdom Org: guest.ibmcloud@mail.com Space: dev

Watson Studio

Welcome to Watson Studio, let's get started.

Get Started

Documentation

From getting started to how to's — see what's available.

Community

Check out our tutorials, articles, along with sample notebooks and data sets you can use to get going.

4. Click the **Get Started** button to open **Watson Studio**.

5. Click on **Continue** to select existing Organization and Space.

The screenshot shows a configuration interface for selecting an organization and space. At the top, there's a header with links for 'IBM Watson', 'Projects', 'Community', 'Services', 'Manage', 'Support', and 'Docs'. To the right of the header is a notification bell icon and a message 'No account selected'. Below the header is a section titled 'Select Organization and Space' with the sub-instruction 'Confirm your IBM Cloud organization and space information below.' It includes a link 'Or create new organization and space'. There are four dropdown menus for selecting account, organization, space, and resource group. A 'Continue' button is at the bottom.

Select Organization and Space

Confirm your IBM Cloud organization and space information below.
[Or create new organization and space](#)

Select IBM Cloud account
team6 IBM's Account

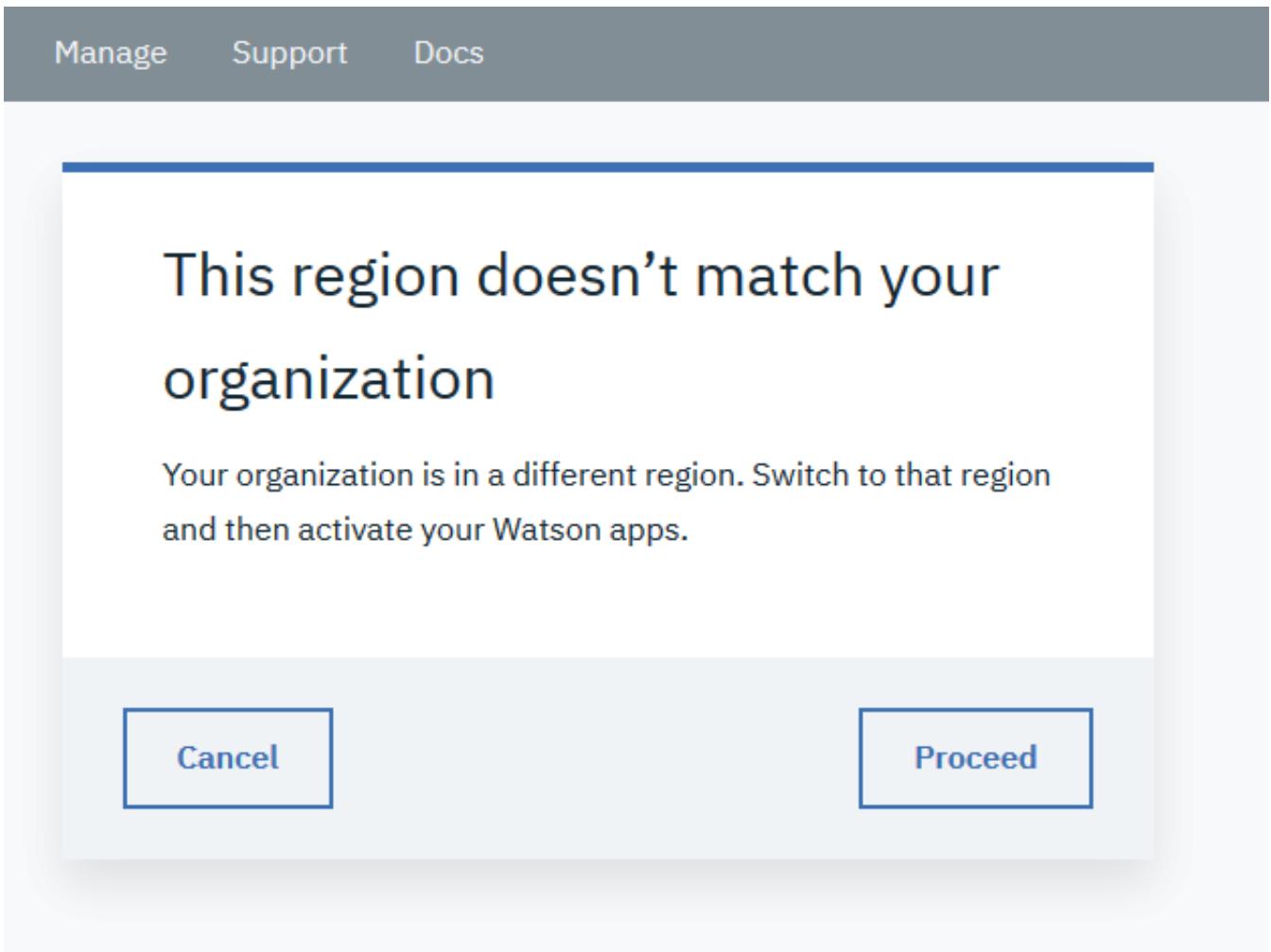
IBM Cloud Organization
team6.ibm@mail.com

IBM Cloud Space
VRWorkshop

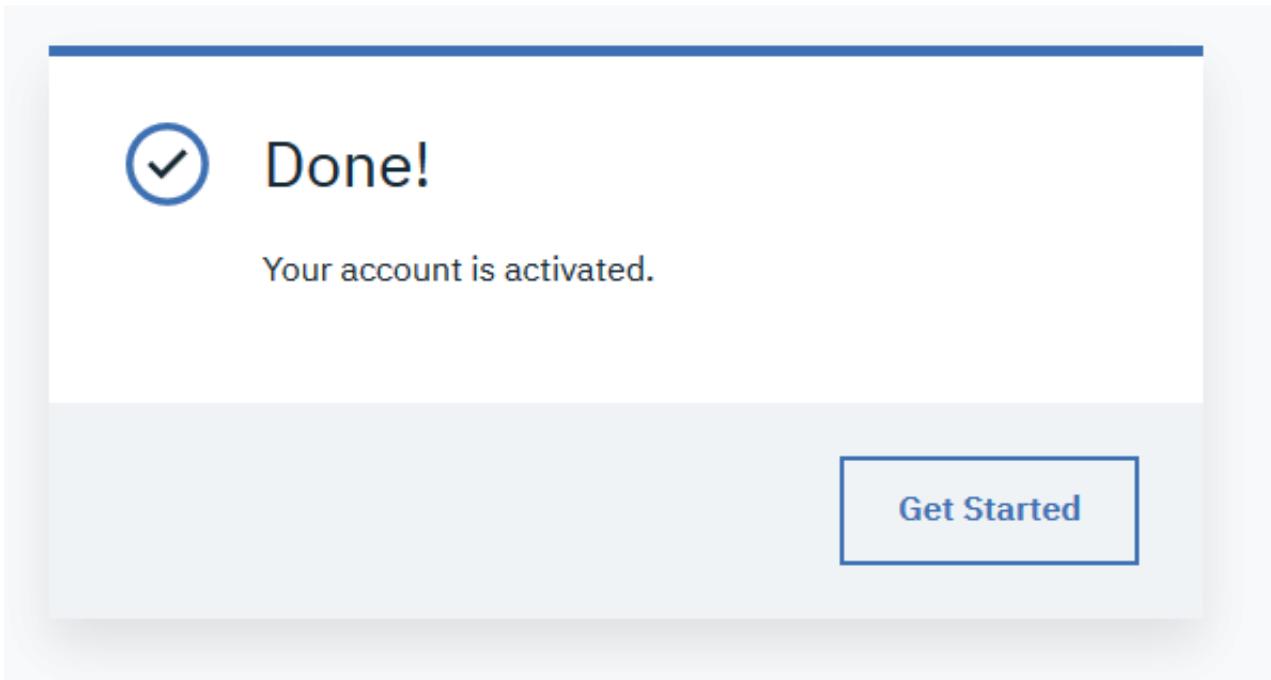
IBM Resource Group
Default

Continue

If you have the following screen, please **contact an instructor** to get a "feature code" to be able to create a space in US South region.



6. Click on **Get Started** to access your activated Watson Studio account



7. You can follow the Watson Studio introduction, and when ready, click the **New project** tile to begin this new custom image recognition model.

A screenshot of the Watson Studio home page. The top navigation bar includes links for "IBM Watson", "Projects", "Tools", "Catalog", "Community", "Services", "US South", and user profile icons. A "Get started" dropdown menu is also present. The main content area features a "Welcome Bill!" message and a banner stating "Watson Studio and Watson Knowledge Catalog are both part of IBM Watson." Below this, a section titled "Get started with key tasks" displays five tiles: "New project" (with a document icon), "Catalog and find data" (with a catalog icon), "Refine data" (with a chart icon), "New notebook" (with a notebook icon), and "Deep learning" (with a flask icon). Navigation arrows are located on the left and right sides of the task tiles.

8. Choose the **Visual Recognition** template and click **OK**.

[← Back](#)

Create a project

Choose the project starter for your work. Required services with Lite plans are provisioned automatically. You can add other assets and services later.



Standard

Work with any type of asset. Add services for analytical assets as you need them.



Import project

Import a project

Data Science and AutoAI

Analyze and model data to discover insights or generate predictions.

ASSETS

Data • Notebooks • AutoAI Experiments

Visual Recognition

Tag and classify visual content using the Watson Visual Recognition service.

ASSETS

Data • Visual recognition model

[Create Project](#)

Deep Learning

Build neural networks and deploy learning models.

ASSETS

Data • Modeler flow • Model • Experim

9. Enter a name for your project (e.g. Visual Reco) and a description if you like then click the **Create** button.

IBM Watson Projects Tools Community Services Manage Support Docs

New project

Create a project for your custom model. A project is how you organize your resources to work with data and share assets with collaborators.

Define project details

Name
My Pizza Quality Check Project

Description
This project will be used for training Watson to determine a good looking pizza versus a bad looking pizza from examining a photo of a never before seen pizza.

Storage
cloud-object-storage-dsx

Watson Visual Recognition
watson-vision-combined-dsx

Choose project options

Restrict who can be a collaborator (i)

Project will include integration with Cloud Object Storage for storing project assets and Watson Visual Recognition for model training and deployment.

Additional tools and services can be added in Project Settings after project creation.

- This project will create a Watson Visual Recognition service and the needed Cloud Object Storage.

Great! You have created a new machine learning project that you can collaborate on with others, upload data-sets, and create training models. Additionally, this project wizard has instantiated the Watson Visual

Recognition service that is pre-trained on millions of consumer oriented images and can be used with no additional training (as we'll see below).

However, since consumer data represents only 20% of the world's data, we will create a custom model below to teach Watson your business and what insights are in your images that consumer trained visual recognition software just doesn't cover.

Test the General model

Before creating a custom model, let's try some of the pré-trained models : the **General**, **Food** and **faces** models that IBM has already trained on millions of images.

1. Click the **watson-visual-combined-dsx** link for the Watson Visual Recognition service that was automatically created for you.

Watson services		View all (7)	Add service 
Instance name	Service	Plan	Tool
JLC-ML	Machine Learning		
JLC-ML-2019	Machine Learning		
JLC1	Machine Learning		
Machine Learning-j3	Machine Learning		
ML-JLC	Machine Learning		
watson-vision-aios	Visual Recognition		Launch tool 

Therefore select one of the available pre-trained models (General, Faces, Food,) and test it as following example using the general model.

Visual Recognition : watson-vision-aios

Associated project : AIOS

[Overview](#)[Credentials](#)**Classify Images**

Create custom, unique visual classifiers. Use the service to recognize custom visual concepts that are not available with general model.

[Create Model +](#)**Detect Objects**

PRIVATE BETA

Create custom, visual collections and identify objects within images using object coordinates.

[Request Access](#)**General**[Copy classifier ID](#)

Generate class keywords that describe the image. Use your own images, or extract relevant image URLs from publicly accessible webpages for analysis.

[Test](#)**Faces**[Copy classifier ID](#)

Detect human faces in the image. This service also provides a general indication of age range and gender of faces.

[Test](#)

1. Click the **Test** button of the **General** model panel.
2. Click the **Test** tab of this model to upload an unlabeled image that Watson will examine to determine what insights can be gleaned from Watson's training of millions of images.

IBM Watson Projects Tools Catalog Community Services US South    

Projects / My Pizza Quality Check / default     

General

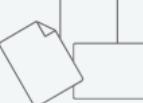
Associated Service : watson_vision_combined-dsx

[Overview](#) [Test](#) [Implementation](#)

Filter

Threshold 0  1

Class



Drop images here to let the classifier analyze them or [browse](#) to select files.

3. Locate your favorite image search tool to find test images, use your personal images or drag images from **Test images** folder

General

Associated Service : watson-vision-combined-dsx

Overview Test Implementation

Filter

Threshold 0.0
0 1

Class

- alizarine red color
- athlete
- athletic game
- ball carrier (football)
- basketball
- basketball player
- blue color
- building
- claret red color
- Clubbing
- competition
- contact sport
- contestant
- flatmate
- forward player (ball game)
- friendship
- Indian red color
- nightclub
- outdoor game
- people
- person
- player
- professional football

[x Clear results](#)

skysports-poland-robert-lewandowski-kaza...



alizarine red color	0.98
person	0.90
contestant	0.87
sport	0.80
athlete	0.79
basketball player	0.71
forward player (ball game)	0.71
soccer (football) player	0.62
Soccer Stadium	0.55
winger	0.54
people	0.51
competition	0.51
player	0.50

1383146671-pizza-tv-630.jpeg



reddish orange color	0.67
Indian red color	0.64
person	0.63
flatmate	0.58
people	0.56
friendship	0.50

polandvromania.jpeg



claret red color	1.00
sport	0.88
athletic game	0.81
contestant	0.77
person	0.77
ball carrier (football)	0.66
soccer (football) player	0.66
player	0.66
professional football	0.56
contact sport	0.56
outdoor game	0.53
basketball	0.50

Comment_réussir_sa_soirée_foot1.png



ultramarine color	0.75
people	0.60
person	0.60
sport	0.60
Clubbing	0.60
blue color	0.52
nightclub	0.50
building	0.50

- Notice it displays the confidence score (which is the statistical probability of this classification against other classifiers in this model).

Now let's explore the Faces model.

- Click the **watson-vision-XXX** (name of your instance) link to return to the model choices.
- Click the **Test** button of the **Faces** model.
- Click the **Test** tab of this model then drag images from **Lab1/Lab1 – Test images** folder on the canvas.

IBM Watson Projects Tools Community Services Docs Support

Projects / My Pizza Quality Check / detect_faces

Faces

Associated Service : watson-vision-combined-dsx

Overview Test Implementation

Filter

Threshold 0.0

Class

- Female
- Male

Clear results



polandvromania.jpeg

Face 1	Age: 25 to 28	1.00
	Male	1.00
Face 2	Age: 26 to 29	1.00
	Male	1.00
Face 3	Age: 23 to 26	0.93
	Male	1.00



skysports-poland-robert-lewandowski-kaza...jpeg

Face 1	Age: 24 to 26	1.00
	Male	1.00
Face 2	Age: 30 to 33	0.82
	Male	1.00



1383146671-pizza-tv-630.jpeg

Face 1	Age: 28 to 31	0.86
	Male	1.00
Face 2	Age: 26 to 29	0.75
	Male	1.00
Face 3	Age: 19 to 22	0.83
	Male	1.00
Face 4	Age: 13 to 16	0.79
	Female	1.00



Comment_réussir_sa_soirée_foot1.png

Face 1	Age: 23 to 26	0.82
	Male	1.00
Face 2	Age: 20 to 22	1.00
	Male	1.00
Face 3	Age: 20 to 23	0.97
	Male	1.00
Face 4	Age: 38 to 41	0.77
	Female	1.00

As you can see, the Faces model not only detect the number of persons, but also the gender and an estimate of the age. It also locates the position of each faces on the picture.

Now let's explore the food model.

1. Click the **watson-vision-XXX** (name of your instance) link to return to the model choices.
2. Click the **Test** button of the **Food (Beta)** model.
3. Click the **Test** tab of this model then drag images from `Lab1/Lab1 - Test images` folder.

IBM Watson Projects Tools Community Services Docs Support

Projects / My Pizza Quality Check / food

Food

Associated Service : watson-vision-combined-dsx

Overview Test Implementation

Filter

Image	Class	Score
	non-food	1.00
	pizza sausage pizza	0.79 0.50
	non-food	0.99
	non-food	0.98
	non-food	1.00
	non-food	1.00
	non-food	0.99

1. You might notice that almost none of the pictures of detected as food. This is because this model is trained to recognize food only when it is the main subject of the picture.
2. Now drag images from **Crop** folder.

IBM Watson Projects Tools Community Services Docs Support

Projects / My Pizza Quality Check / food

Food

Associated Service : watson-vision-combined-dsx

Overview **Test** Implementation

Filter

Threshold: 0.0

Class:

- anchovy pizza
- bread
- bun
- chili dog
- corn
- frankfurter bun
- grain
- hotdog
- pizza
- popcorn
- sandwich
- sausage pizza
- Sicilian pizza
- snack food

Clear results

Image	Labels	Confidence
im53984d03b058d_cr.jpg	frankfurter bun, bun, bread, sandwich, snack food, hotdog, chili dog	0.78, 0.78, 0.78, 0.76, 0.76, 0.50
soiree-pizza-d-un-club_cr.jpg	pizza, sausage pizza, Sicilian pizza	0.88, 0.67, 0.50
soiree-pizza-d-un-club_cr5.jpg	pizza, anchovy pizza, Sicilian pizza	0.95, 0.87, 0.50
1383146671-pizza-tv-630_cr3.jpg	snack food, hotdog, sandwich, bun, bread, frankfurter bun, chili dog	0.59, 0.59, 0.59, 0.57, 0.57, 0.57, 0.50
Comment_réussir_sa_soirée_foot1_cr.png	corn, grain, popcorn	0.98, 0.98, 0.97

As can see, it might be usefull to divide an image in multiple tiles before querying Visual Recognition service. A good design for such application is to chain multiple classifiers from a generic one to more specific ones to get better model accuracy results.

Out of the box, Watson can tell you what kind of objects are in a photo even though these are your private photos that have not been indexed by a search engine nor contain labeled tags that tell Watson what the photo is about -- instead Watson can deduce this by comparing your photo against the millions of labeled photos that Watson has been trained on.

Yet still, these millions of photos are a drop in the bucket compared to how many photos are in the world and only come from the small 20% of consumer facing data, which leaves 80% of data behind your firewall -- and inside this data is your companies competitive edge.

Therefore, let's examine how easy it is to teach Watson something that consumer oriented AI doesn't do.