

# Visual Recognition Workshop

## Lab 1 : Using Visual Recognition with UI

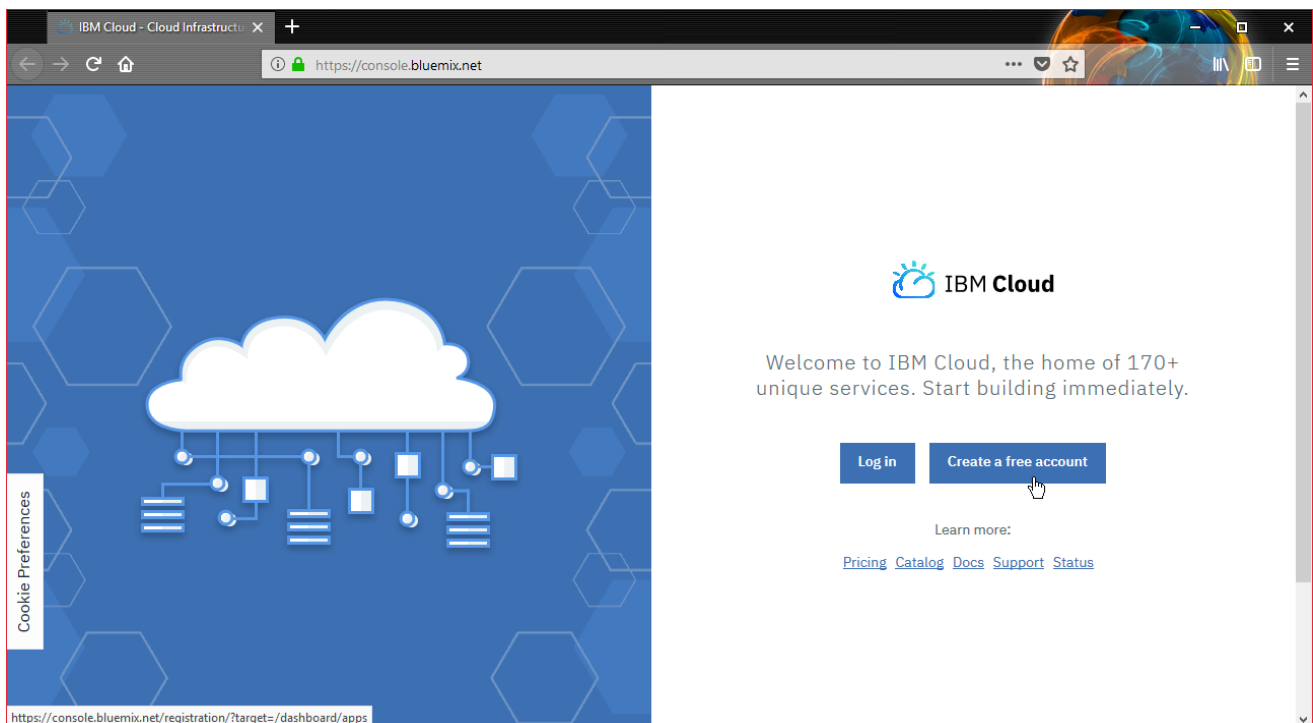
### Objective

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 the image. In these labs, we will train Watson to detect that a customer's pizza is messed up (e.g. burned, toppings pushed to one side, cheese stuck to the box, etc.) versus a pizza that isn't. You could imagine a Pizzeria using this for automatically sending a new pizza to customers that complained about a pizza delivery for example.

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> and click on **Create a free account**



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.

← → ↻ 🏠 <https://console.ibmcloud.net/registration?target=%2Fdashboard%2Fapps> ... 🌙 ⭐



Sign up for an IBMid and create your IBM Cloud account

## Build on IBM Cloud for free with no time restrictions

**Guaranteed free development with Lite plans**  
Develop worry-free and at no cost with cap based Lite plan services for as long as you like.

**Start on your projects right away**  
Skip entering your credit card info and get working in just a few short steps.

**Get \$200 to do more on our platform.**  
Use the credit to try new services or scale your projects. Offer is available for 1 month after upgrade, for platform services only.

Ready to get started? Sign up today!

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

Email\* ✓  
team4.ibm@gmail.com

First Name\* ✓  
Team4

Last Name\* ✓  
IBM

Company ✓  
IBM

Country or Region\* ✓  
United States

Password\* •••••••• 👁

Keep me informed of products, services, and offerings from IBM companies worldwide.

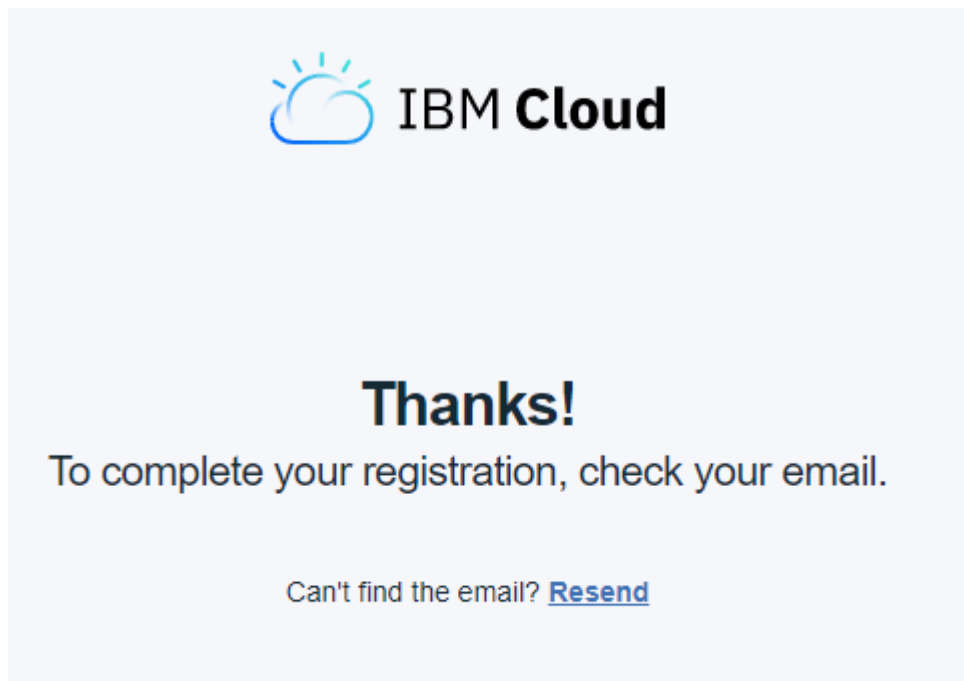
☒ Please keep me informed by email of products, services and offerings from IBM companies worldwide.

By clicking Create Account, I accept the [IBM Cloud privacy policy](#) and [IBM Cloud terms](#).

Create Account

Then click on `Create Account`

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



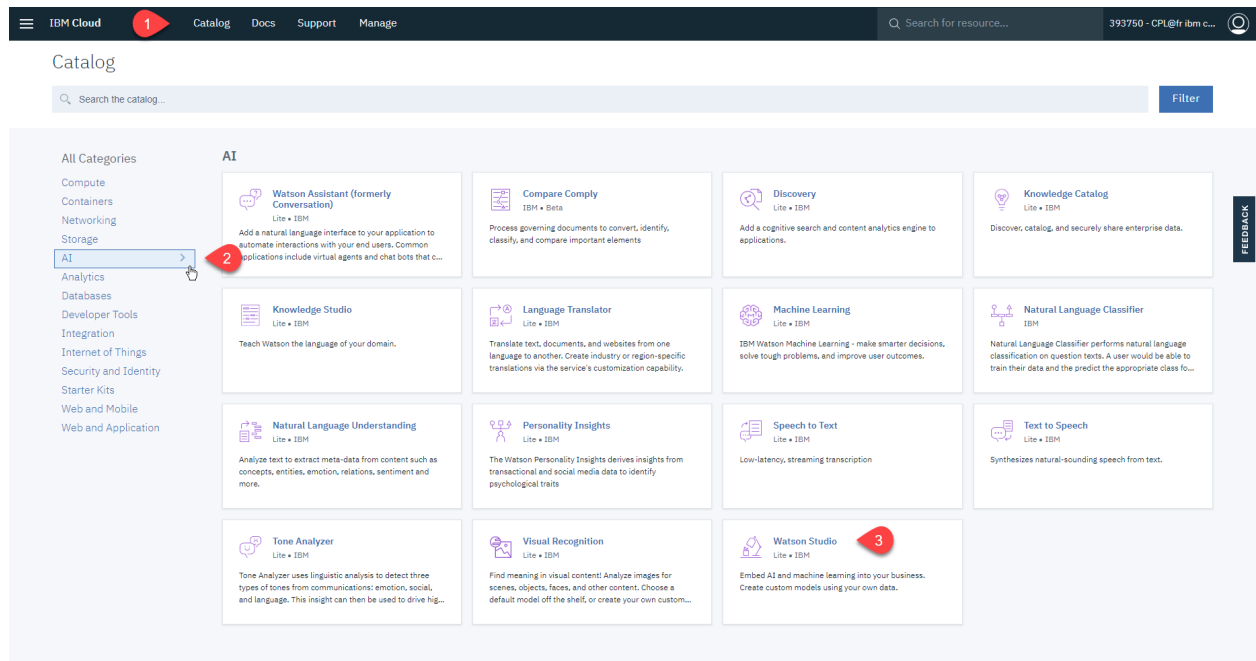
# Success!

You successfully signed up for an IBM Cloud account and it is now activated.

[Log in](#)

## Create the service on the IBM Cloud

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



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

IBM Cloud Catalog Docs Support Manage

Search for resource... 393750 - CLI@fr.ibm.c...

View all Watson Studio Lite • IBM

Watson Studio democratizes machine learning and deep learning to accelerate infusion of AI in your business to drive innovation. Watson Studio provides a suite of tools and a collaborative environment for data scientists, developers and domain experts.

View Docs Terms

AUTHOR IBM  
PUBLISHED 08/22/2018  
TYPE Service

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**  
Start from a tutorial, start from a sample, or start from scratch. Tap into the power of the best of open source (RStudio, Jupyter Notebooks) and Watson services for flexible model creation. Use Python, R, or Scala. Stop downloading and configuring analysis environments and start getting insights.
- **Power on demand**  
Enterprise-scale features on demand. From data exploration and preparation, to enterprise-scale performance. Manage your data, your analytical assets, and your projects in a secured cloud environment.
- **Be a founding member**  
Take advantage of shared data sets, notebooks, models, and tutorials. Share your work with your team and your peers across job roles. Join a vibrant community of data scientists, developers, and domain experts across industries, functions, and organization types.
- **Collaborate for better outcomes**  
Work with your peers on projects to find better solutions together. Share your knowledge and your work easily with visualizations and code - and help fuel the advancement of data science and AI for all.

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.

IBM Cloud Catalog Docs Support

Manage Plan

Watson / 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.

IBM Watson Projects Community Services Manage Support Docs No account selected 11

### 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.

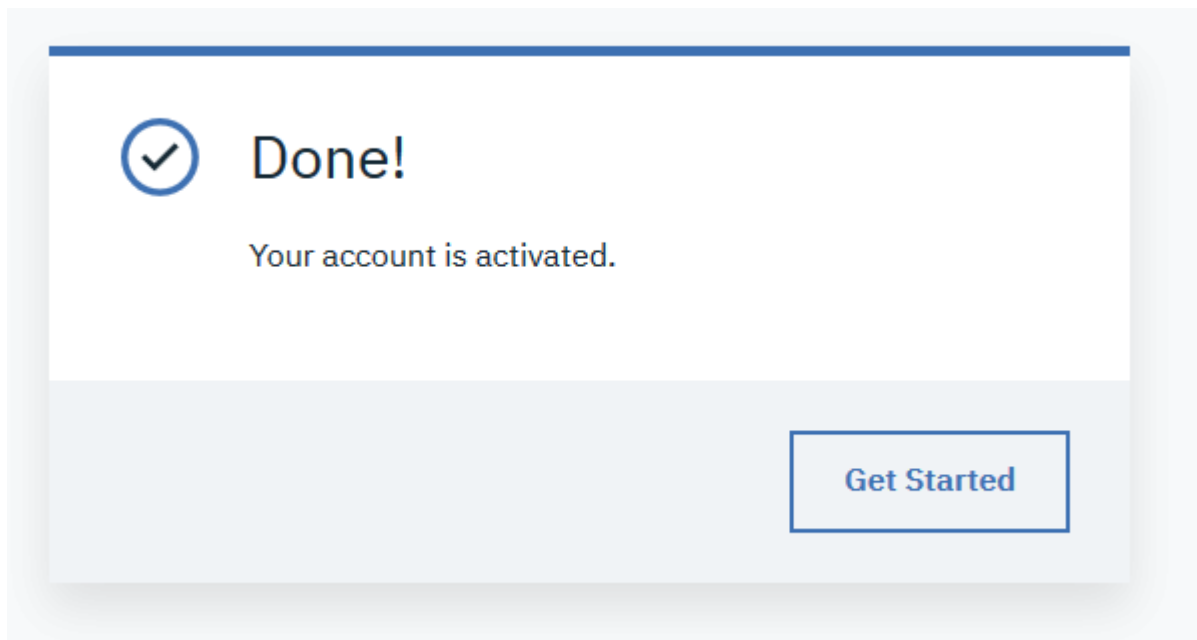
Manage Support Docs

## This region doesn't match your organization

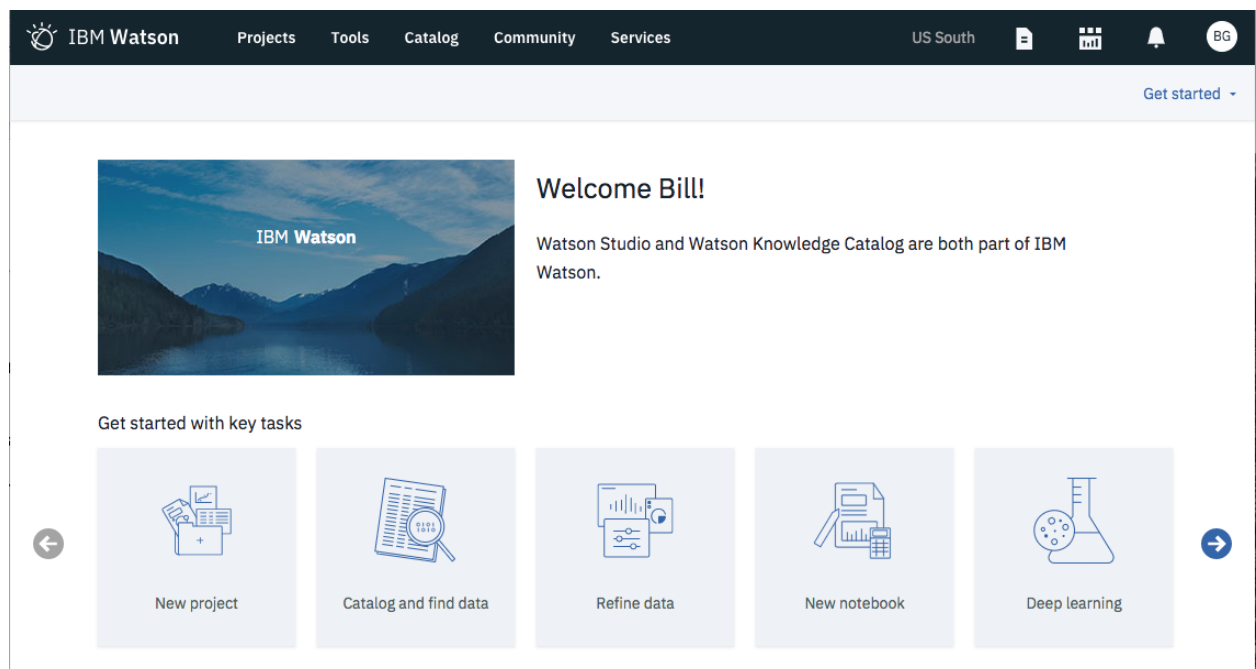
Your organization is in a different region. Switch to that region and then activate your Watson apps.

Cancel Proceed

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.



8. Choose the **Watson Tools** template and click **OK**.

## New project

Select a project tile to get the right tools and services for your work.

You can add additional tools later as the needs of your project grow. All projects include data storage.

### Basic

Want to start simple? Upload data in your project and add tools later.

### Data Science

Analyze data to discover insights and share your findings with others.

### Watson Tools

Tag and classify content using Watson services.

### Deep Learning

Build neural networks and deploy deep learning models.

### Modeler

Build modeler flows to train SPSS and Spark models or design deep neural networks.

### Business Analytics

Create visual dashboards from your data to gain insights faster.

### Data Engineering

Combine, cleanse, analyze, and shape data using Data Refinery.

### Complete

Want to explore every corner of Watson Studio? See every tool in one project.

Cancel

OK 

9. Enter a name for your project (e.g. My Pizza Quality Check) and a description if you like then click the **Create** button.

IBM Watson

ProjectsToolsCommunityServicesManageSupportDocs

## 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 examinina a photo of a never before seen pizza.

Choose project options

☐ Restrict who can be a collaborator ⓘ

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.

### Storage

cloud-object-storage-dsx

### Watson Visual Recognition

watson-vision-combined-dsx

- 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 check out the **General** model and the **Food** model 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.



# Default Custom Model

Associated Service : [watson-vision-combined-dsx](#)

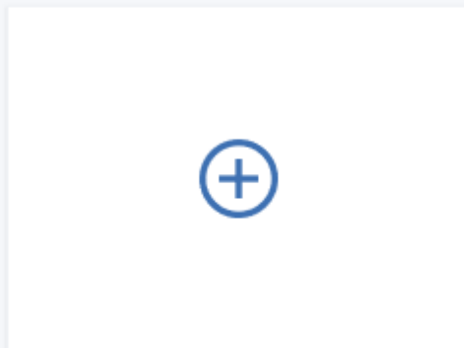


My Classes

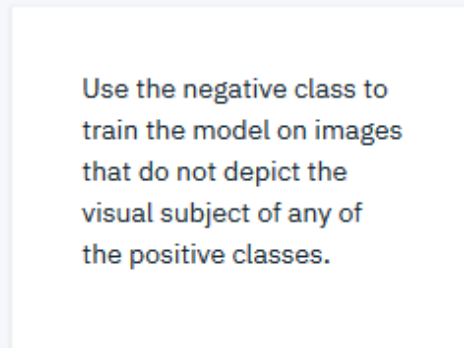
All Images

Drag and drop zip files from your project.

1 class | 0 incomplete classes | 0 unclassified images



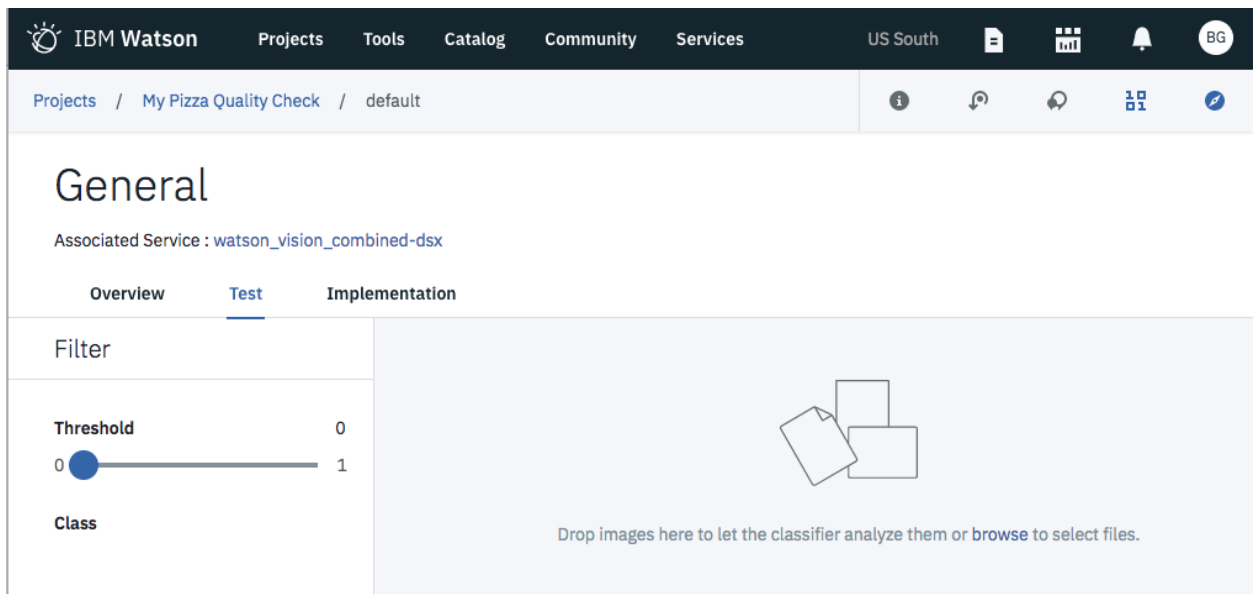
Create a class



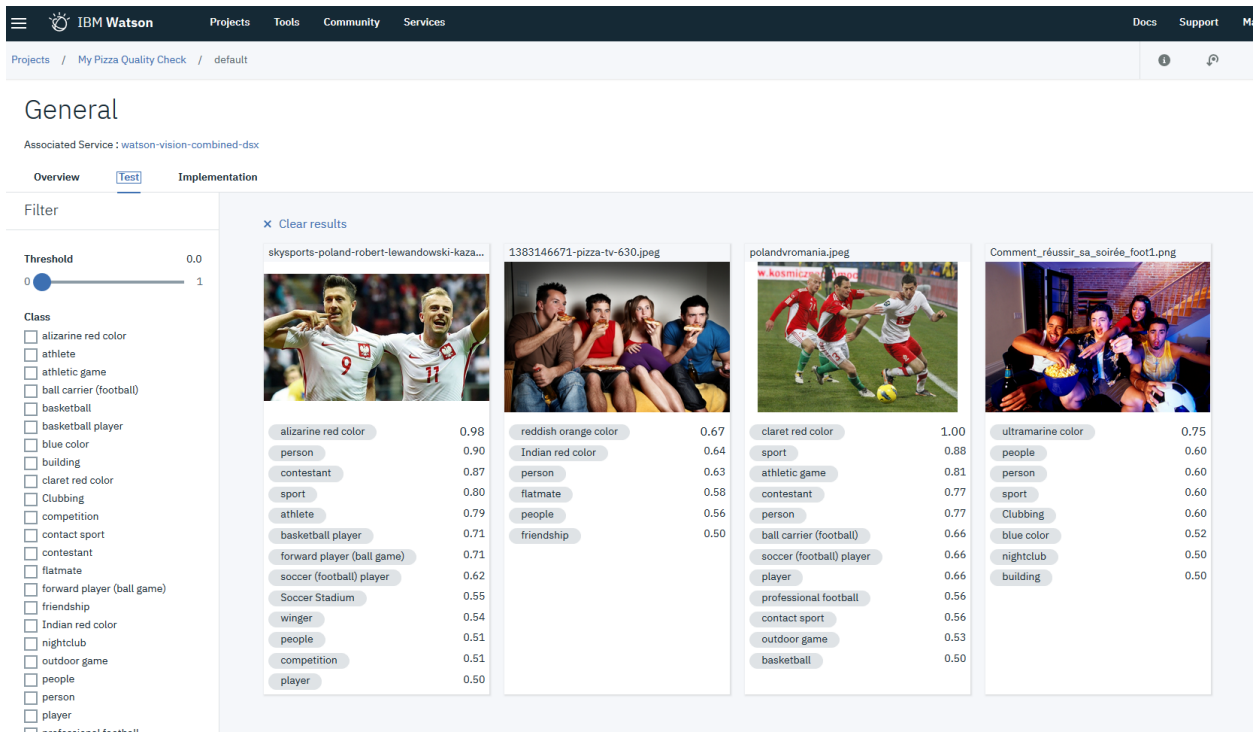
Negative (recommended) ☐

0 images

2. Click the **Test** button of the **General** model panel.
3. 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.



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



- 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.

1. Click the **watson-vision-combined-dsx** link to return to the model choices.
2. Click the **Test** button of the **Faces** model.
3. 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 1

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...



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.

- Click the **watson-vision-combined-dsx** link to return to the model choices.
- Click the **Test** button of the **Food (Beta)** model.
- 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

Threshold 0.0 1

Class  
☐ non-food  
☐ pizza  
☐ sausage pizza


× Clear results

1383146671-pizza-tv-630.jpeg



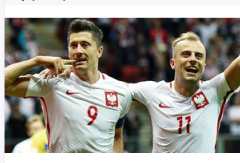
non-food 1.00

soiree-pizza-d-un-club.jpeg




pizza 0.79  
sausage pizza 0.50

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




non-food 0.99

im53984d03b058d.jpeg




non-food 0.98

polandnationalfootballteameuro2016.jpeg




non-food 1.00

polandvromania.jpeg



non-food 1.00

Comment\_réussir\_sa\_soirée\_foot1.png



non-food 0.99

- 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.

6. Now drag images from **Crop** folder.

The screenshot shows the IBM Watson Visual Recognition interface. The top navigation bar includes 'IBM Watson', 'Projects', 'Tools', 'Community', 'Services', 'Docs', and 'Support'. Below the navigation bar, the breadcrumb trail reads 'Projects / My Pizza Quality Check / food'. The main heading is 'Food', with the associated service 'watson-vision-combined-dsx'. The interface has three tabs: 'Overview', 'Test', and 'Implementation', with 'Test' being the active tab. On the left, there is a 'Filter' section with a 'Threshold' slider set to 0.0 and a 'Class' list with checkboxes for various food items. The main area displays four image classification results, each with a 'Clear results' button and a list of predicted classes with their confidence scores.

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

As can see, it might be useful to divide an image in multiple tiles before querying Visual Recognition service. As you will see in another lab, it might also be interesting to chain multiple classifiers, from a generic one to a specific one to achieve expected 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 company's competitive edge.

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