

Visual Recognition Workshop

Lab 1 : Using Visual Recognition with UI

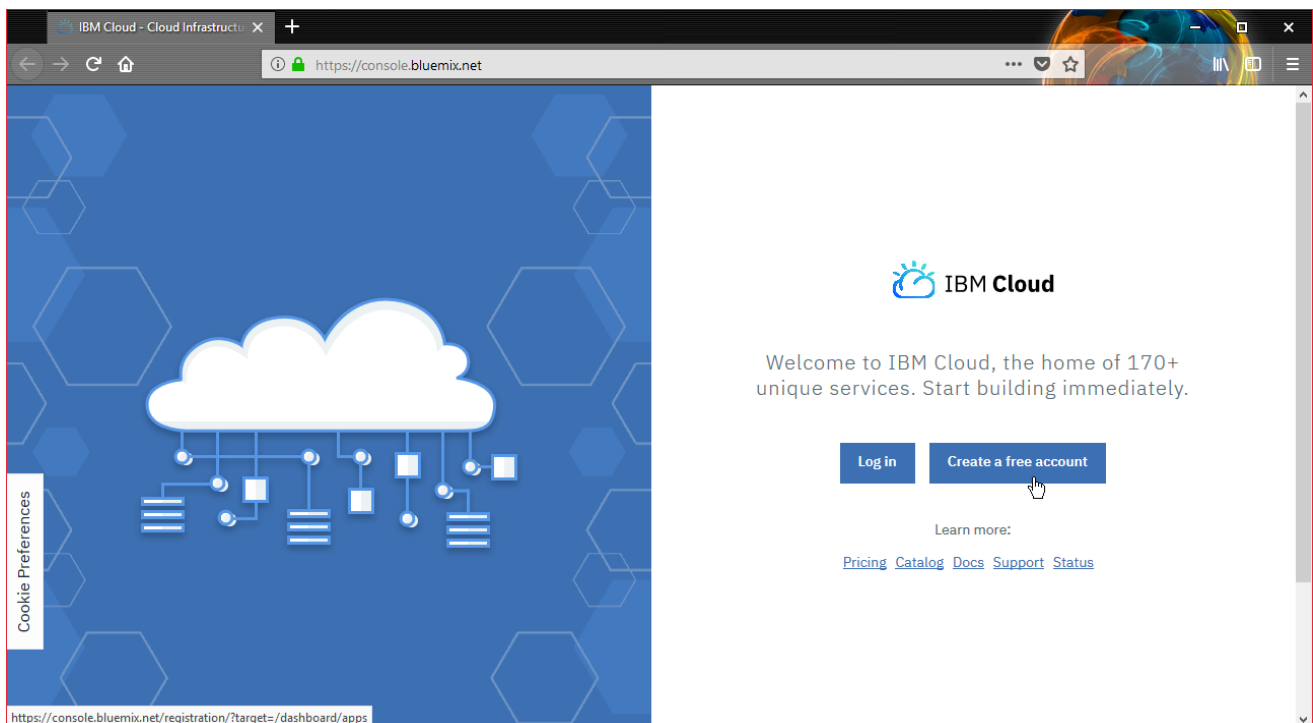
Objective

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 as country to be able to use beta features of IBM Cloud.

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

**IBM Cloud**

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* ✓

First Name* ✓

Last Name* ✓

Company ✓

Country or Region* ✓

Password* 

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

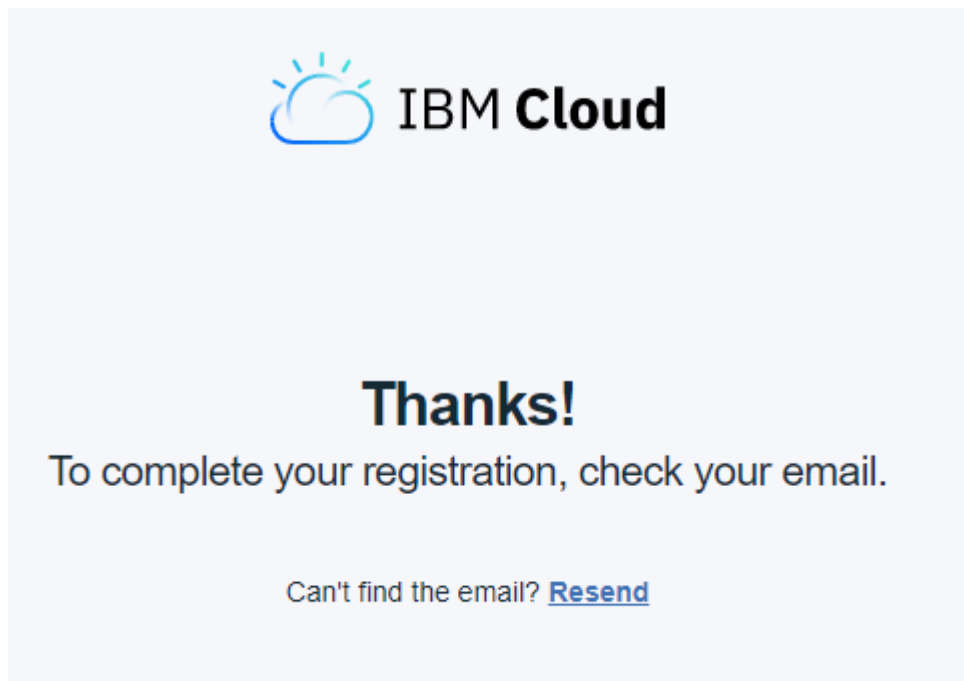
☒ Please keep me informed by email of products, services and offerings from IBM companies worldwide.

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

[Create Account](#)

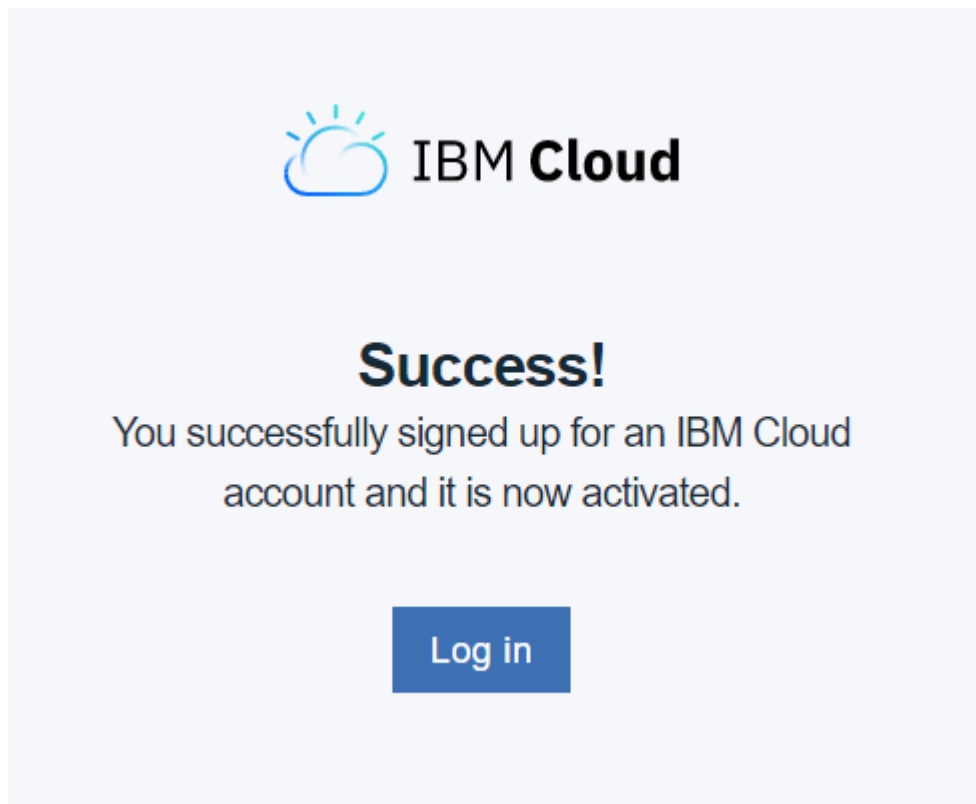
Then click on [Create Account](#)

[Create Account](#)



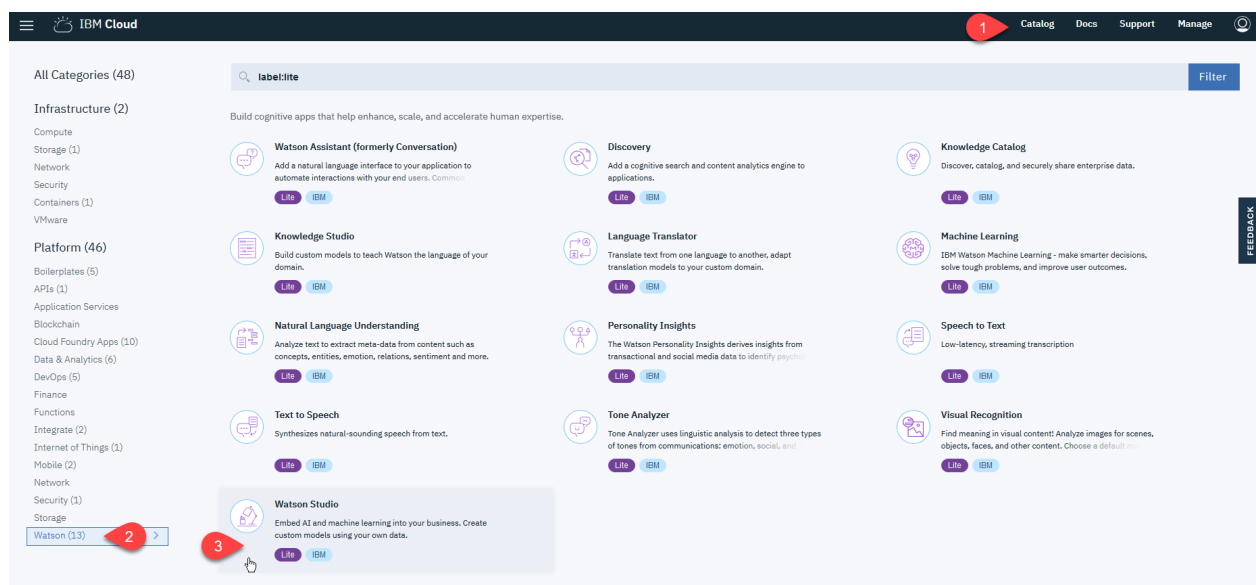
A confirmation email should be sent shortly, entitled [Action required: Confirm your IBM Cloud account](#). Follow the instructions in this message to validate your account on IBM Cloud.

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



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 **Watson** 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.

[Catalog](#)
[Docs](#)
[Support](#)
[Manage](#)

[View all](#)

Watson Studio

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.

Service name:

Watson Studio-pizza

Choose a region/location to deploy in:

US South

Choose an organization:

wgriffith@us.ibm.com

Choose a space:

dev

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.

Metadata:

AUTHOR: IBM

PUBLISHED: 03/20/2018

TYPE: Service

LOCATION: United Kingdom, US South

Need Help?
[Contact IBM Cloud Sales](#)

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.

[Catalog](#)
[Docs](#)

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

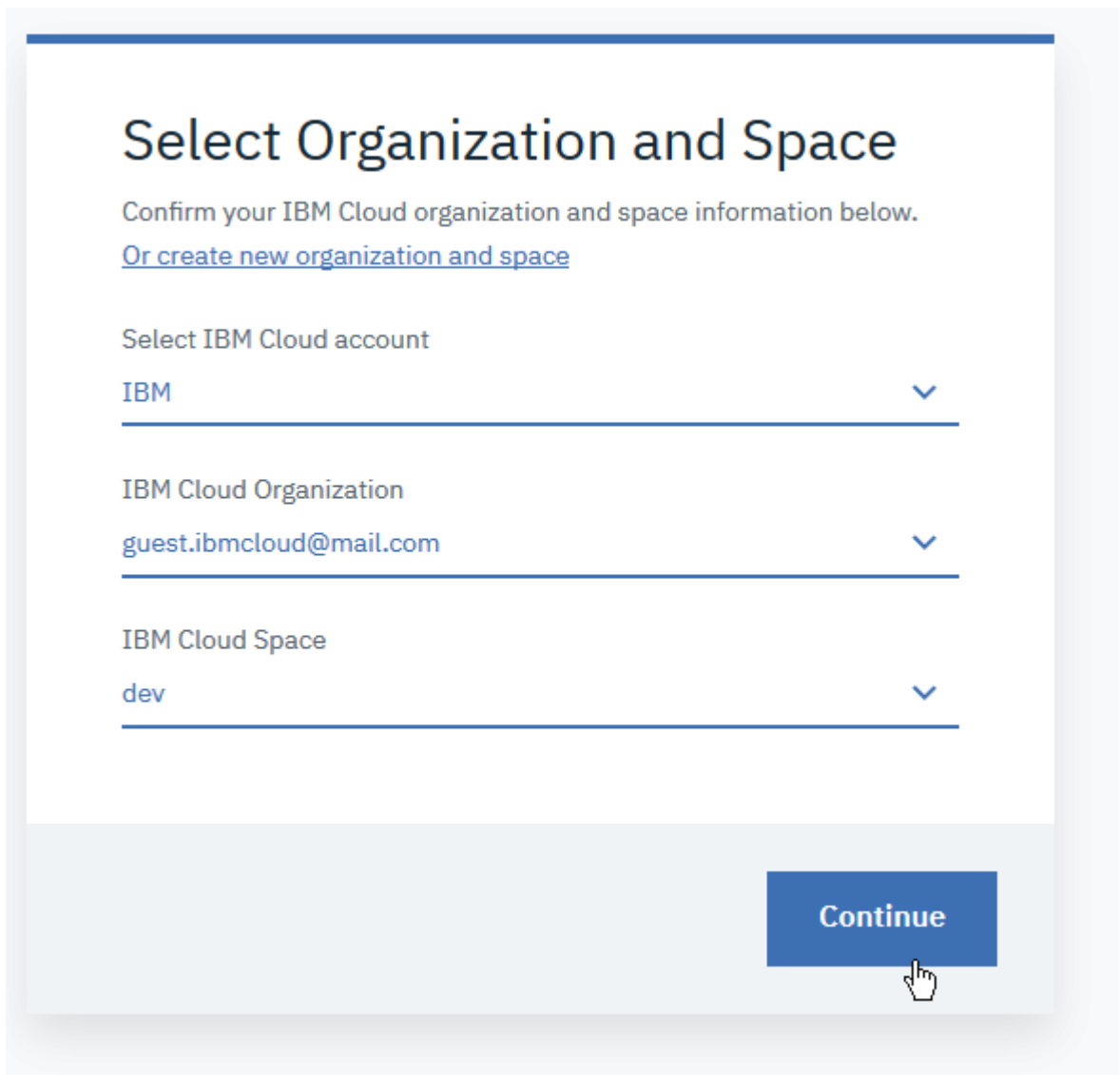
Documentation

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.

- Click the **Get Started** button to open **Watson Studio**.
- Click on **Continue** to select existing Organization and Space.
-



Select Organization and Space

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

Select IBM Cloud account

IBM

IBM Cloud Organization

guest.ibmcloud@mail.com

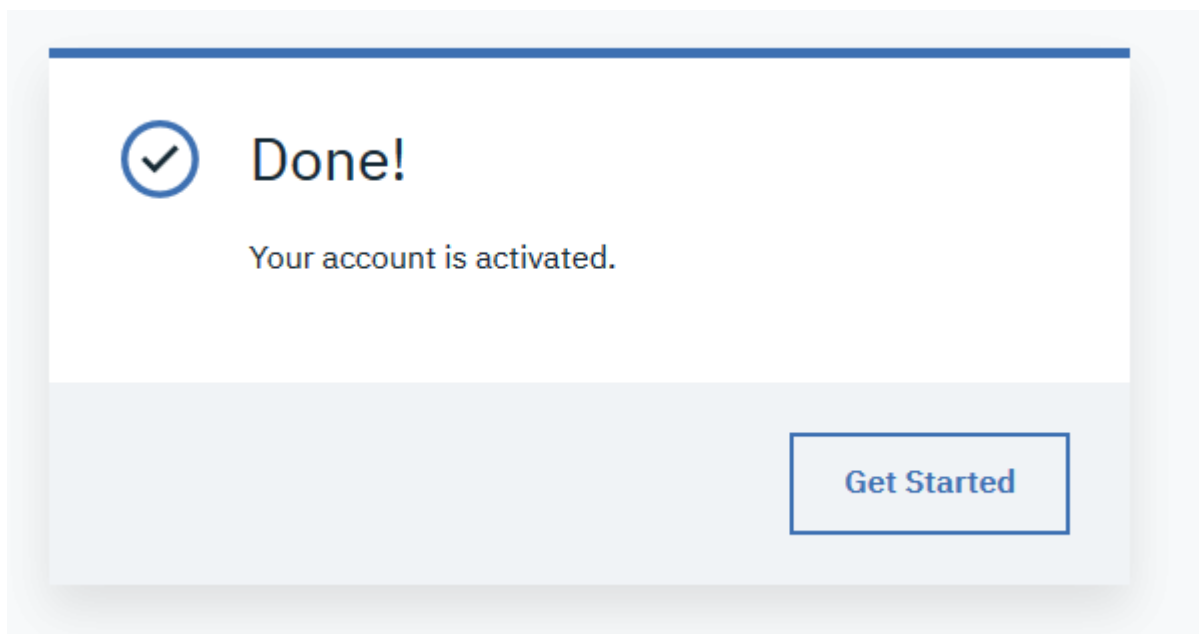
IBM Cloud Space

dev

Continue

This screenshot shows a web form titled "Select Organization and Space". It asks the user to confirm their IBM Cloud organization and space information. There are three dropdown menus: "Select IBM Cloud account" (showing "IBM"), "IBM Cloud Organization" (showing "guest.ibmcloud@mail.com"), and "IBM Cloud Space" (showing "dev"). Each dropdown has a blue chevron icon on the right. At the bottom right, there is a blue button labeled "Continue". A mouse cursor is pointing at the "Continue" button.

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



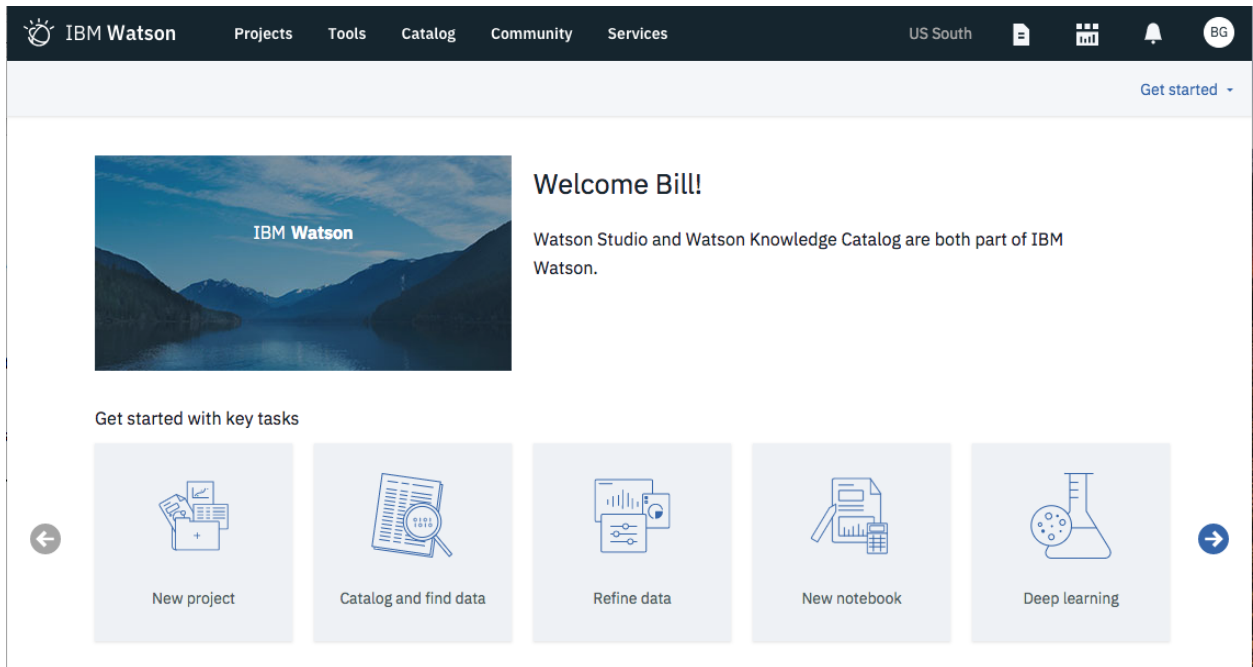
✓ **Done!**

Your account is activated.

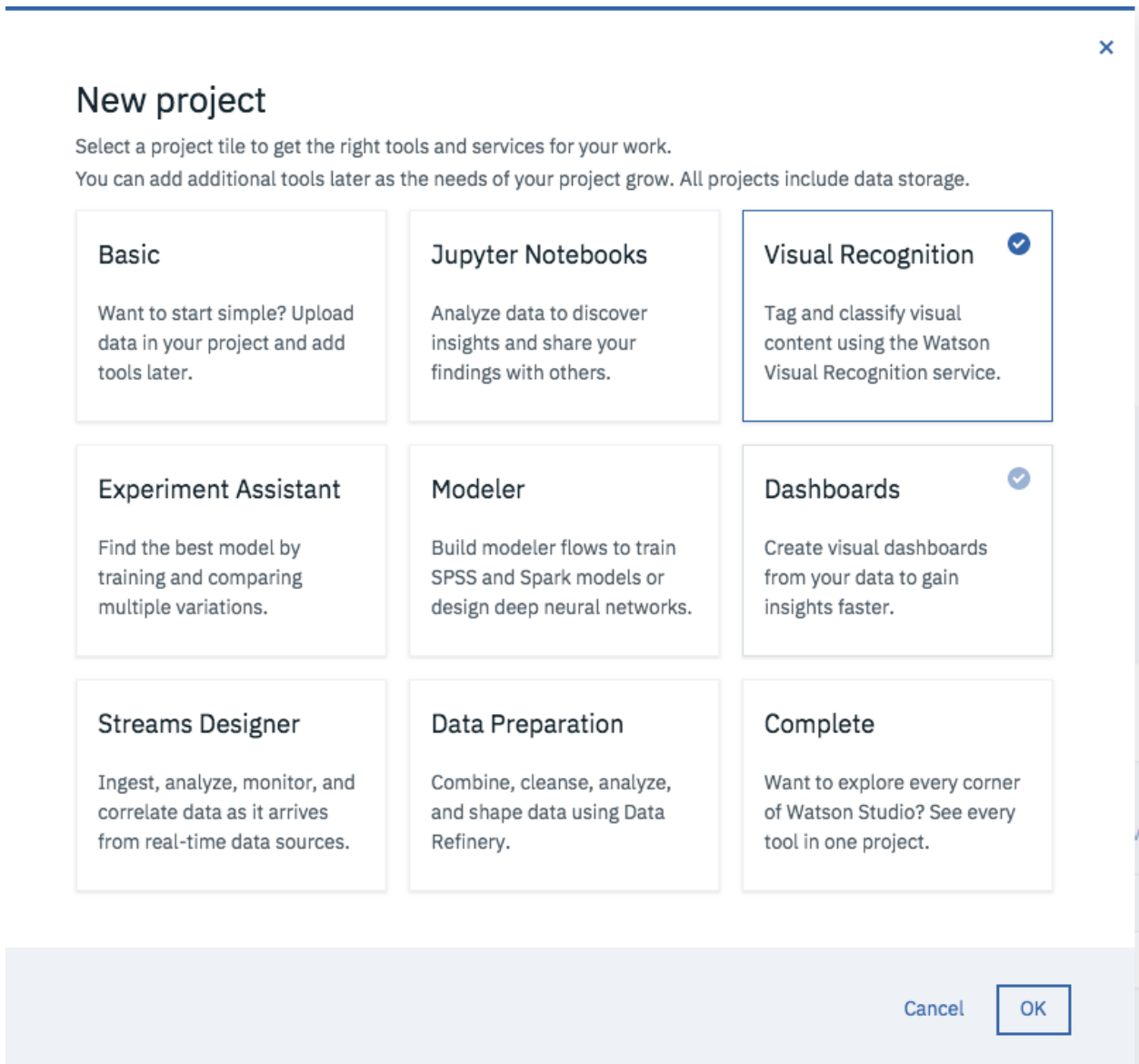
Get Started

This screenshot shows a confirmation screen. At the top left, there is a blue circle with a white checkmark. To its right, the word "Done!" is written in a large, bold, black font. Below this, the text "Your account is activated." is displayed in a smaller black font. At the bottom right, there is a blue button with a black border labeled "Get Started".

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



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



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

The screenshot shows the 'New project' wizard in the IBM Watson interface. The header bar is dark blue with the IBM Watson logo, a hamburger menu, and user initials 'BG'. The main content area is light gray and titled 'New project'. It is divided into three sections: 'Define project details', 'Choose project options', and 'Storage'. In the 'Define project details' section, the 'Name' field contains 'My Pizza Quality Check' and the 'Description' field contains 'This project will be used for training Watson to determine a good pizza versus a bad pizza from examining a photo of a never before seen pizza.' Below the 'Choose project options' section, there is a checkbox for 'Restrict who can be a collaborator' which is checked. The 'Storage' section shows 'cloud-object-storage-ip' selected. At the bottom right, there are 'Cancel' and 'Create' buttons, and a blue circular chat icon.

IBM Watson

New project

Define project details

Name

My Pizza Quality Check

Description

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

Choose project options

☒ Restrict who can be a collaborator

Project will include integration with [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-ip

Watson Visual Recognition

Cancel Create

- 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_vision_combined-dsx** link for the Watson Visual Recognition service that was automatically created for you.

IBM Watson Projects Tools Community Services

Projects / My Pizza Quality Check / Default Custom Model

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

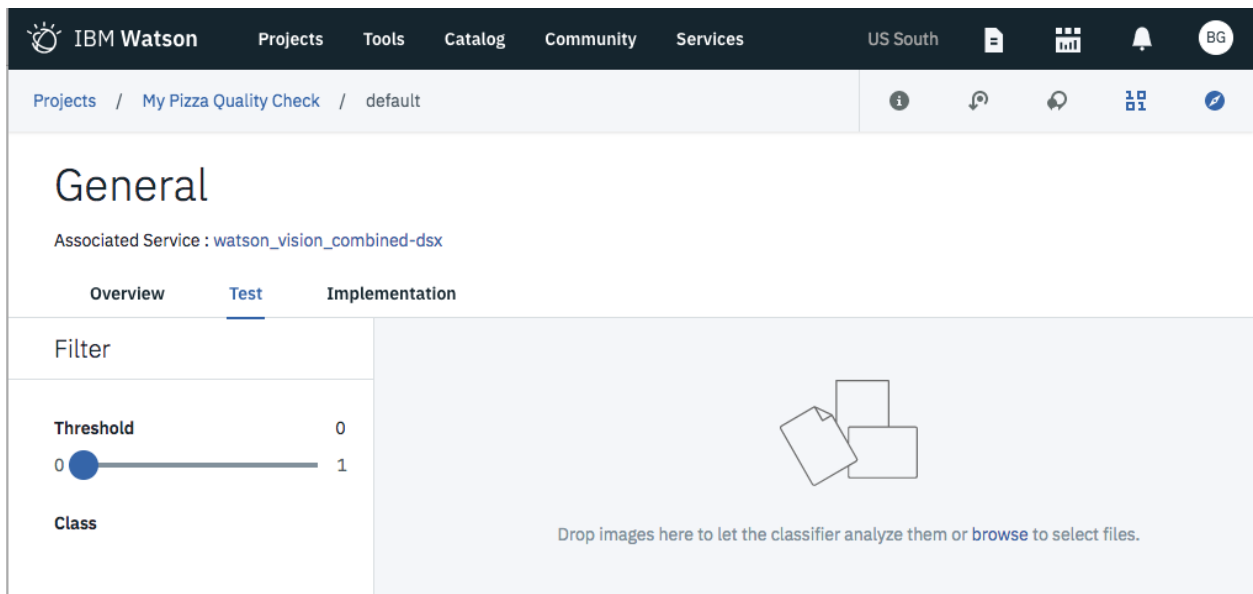
Create a class

Use the negative class to train the model on images that do not depict the visual subject of any of the positive classes.

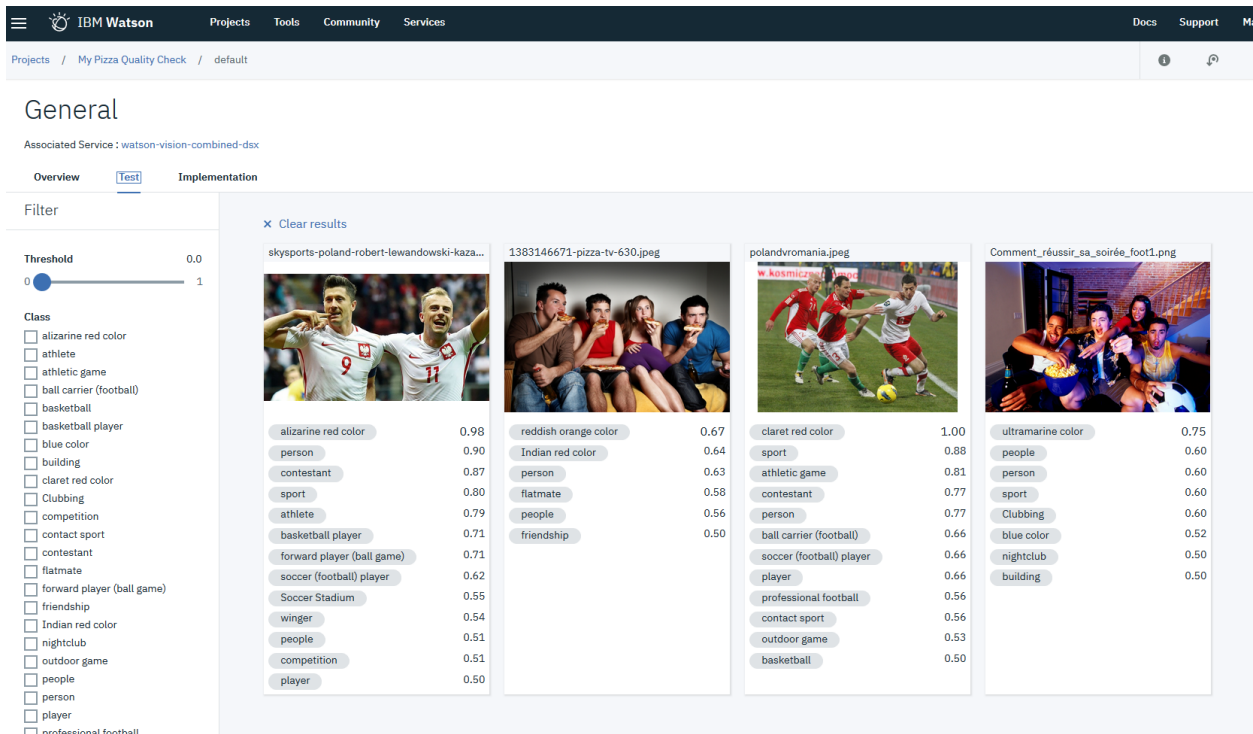
Negative (recommended) ☐

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 or use your personal images and 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 displays the IBM Watson Visual Recognition interface. The top navigation bar includes 'IBM Watson', 'Projects', 'Tools', 'Community', and 'Services'. Below the navigation bar, the breadcrumb trail shows 'Projects / My Pizza Quality Check / food'. The main heading is 'Food', with the associated service 'watson-vision-combined-dsx'. The interface is divided into three tabs: 'Overview', 'Test', and 'Implementation', with 'Test' being the active tab. On the left, a 'Filter' section includes a 'Threshold' slider set to 0.0 and a 'Class' list with checkboxes for various food items. The main area shows four image classification results, each with a small image and a list of predicted classes with their confidence scores. The first image is 'im53984d03b058d_cr.jpg' with predictions like 'frankfurter bun' (0.78) and 'bun' (0.78). The second image is 'soiree-pizza-d-un-club_cr.jpg' with predictions like 'pizza' (0.88) and 'sausage pizza' (0.67). The third image is 'soiree-pizza-d-un-club_cr5.jpg' with predictions like 'pizza' (0.95) and 'anchovy pizza' (0.87). The fourth image is '1383146671-pizza-tv-630_cr3.jpg' with predictions like 'snack food' (0.59) and 'hotdog' (0.59). A fifth image, 'Comment_réussir_sa_soirée_foot1_cr.png', is shown at the bottom with predictions like 'corn' (0.98) and 'grain' (0.98).

Image	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
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
hotdog		0.59
sandwich		0.59
bun		0.57
bread		0.57
frankfurter bun		0.57
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.