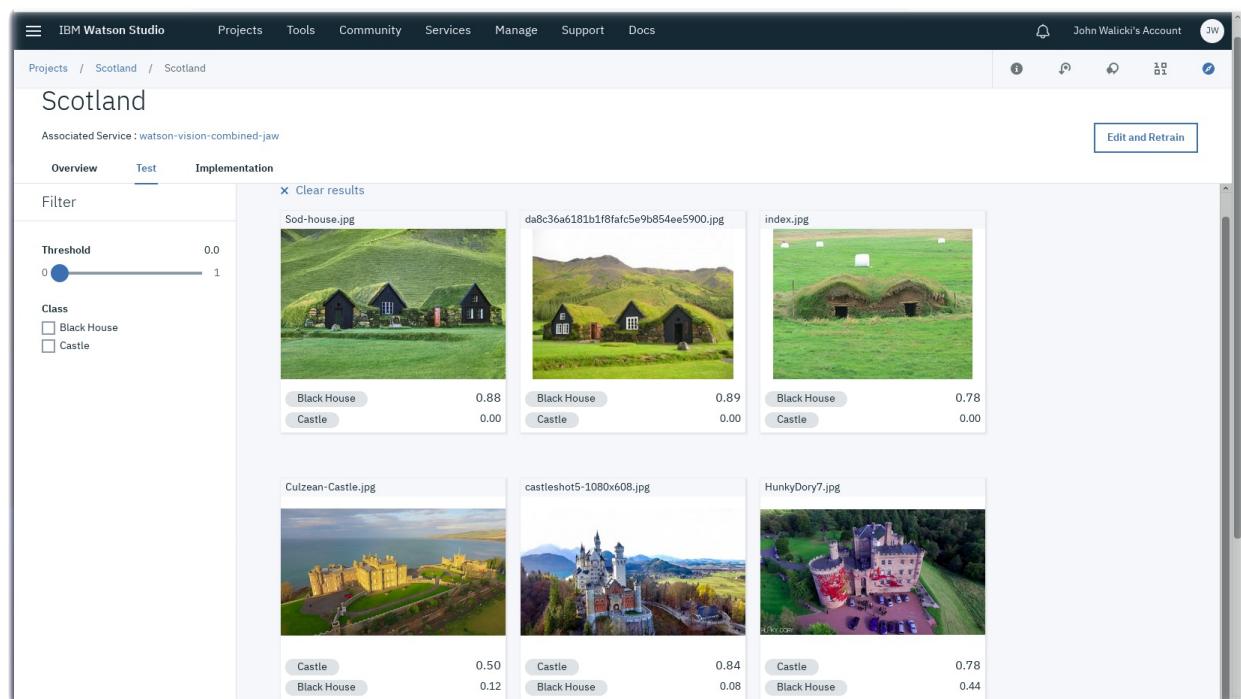


Drones-IoT-Visual-Recognition

Introduction

This hands on lab uses drone aerial images, Watson Studio and Watson Visual Recognition to survey Scottish Countryside and identify Castles and traditional earthen / grass covered Black Houses.



Learning objectives

After completing this tutorial you will be able to:

- Create a Visual Recognition model in Watson Studio running in IBM Cloud
- Capture images from a drone and zip them into a class
- Train a model to identify objects in the images
- Score and count the identified objects

Prerequisites

This tutorial can be completed using an IBM Cloud Lite account.

- Create an [IBM Cloud account](#)
- Log into [IBM Cloud](#)

Estimated time

You can complete this task in no more than 15 minutes.

Hands on Lab Overview

The outline below provides a high level overview of the steps included in the lab instructions.

Step 1 - Learn about Drones

There are many types of drones available that range from toys to industrial use cases. Many of the drones now include a camera that can store or stream aerial video to the ground. Using the livestream video frames, we can sample frames and send the images to Watson Visual Recognition for classification.

- Pocket toy drones
 - [Contixo F8](#)
- Tello - Control a Tello Drone using Node-RED
- Hobbyist drones
- Commercial drones

For this lab, we are not flying the drone indoors or venturing out into a field. If you are interested in purchasing a drone, the instructors can share some of their drone experiences and recommendations.

Step 2 - Capturing Images

One of the fun experiences of flying a drone is capturing video or pictures from a unique aerial perspective. You can use your drone to capture images of interesting objects that you want to train a visual recognition model to autonomously identify.

In this lab, we have created three zip files of pictures recorded by drones. The lab will use these images to identify Scottish Countryside Castles and Black Houses. These images will be used as our training set - we'll download them later.

- Aerial drone images of Castles - [Castles.zip](#)
- Aerial drone images of Black Houses - [BlackHouses.zip](#)
- Aerial drone images of Scottish Countryside to be used for the negative class - [Countryside.zip](#)

Step 3 - Watson Studio

In this section, we will create a Watson Studio account, create a Project and Watson Visual Recognition model to identify images in several classes.

- Create a Watson Studio account - follow these [instructions](#)
- Create a Project
- Create a Visual Recognition model - follow these [instructions](#)
- Upload three zips to Cloud Storage
- Create a class *Castle* - drag a zipfile
- Create another class *Black House* - drag a zipfile
- Create a negative class using the *Countryside* images - drag a zipfile
- Train your model - wait a few minutes

Step 4 - Test your model

In this section you will use sample images to confirm your model.

- Test your model - follow these [instructions](#)

Step 5 - Implement this model in your Application

- Embed your model into an application using these code snippets

Watson Studio Set up and Configuration in IBM Cloud

Lab Objectives

In this lab you will set up Watson Studio with a new Project. You will learn:

- Watson Studio
- How to set up a new Watson Studio Project

Introduction

Watson Studio accelerates the machine and deep learning workflows required to infuse AI into your business to drive innovation. It provides a suite of tools for data scientists, application developers and subject matter experts, allowing them to collaboratively connect to data, wrangle that data and use it to build, train and deploy models at scale. Successful AI projects require a combination of algorithms + data + team, and a very powerful compute infrastructure.

Watson Studio Setup

Create Cloud Object Storage

- Create a Cloud Object Storage instance by visiting the [IBM Cloud Catalog](#)
- Search on **Object** in the IBM Cloud Catalog
- Click on the **Object Storage** service tile

The screenshot shows the IBM Cloud Catalog interface. At the top, there is a navigation bar with links for IBM Cloud, Catalog, Docs, Support, and Manage. A user profile icon is also present. Below the navigation bar, the word "Catalog" is displayed, followed by a search bar containing the text "object". To the right of the search bar is a "Filter" button. The main content area is titled "Storage" and features a service tile for "Object Storage". The tile includes a green cube icon, the text "Object Storage", "Lite • IBM", and a description: "Provides flexible, cost-effective, and scalable cloud storage for unstructured data.". On the left side of the main content area, there is a sidebar with a tree view of categories: "All Categories (6)" (which is expanded), Compute, Containers, Networking, Storage (1), AI (1), Analytics (2), Databases (2), Developer Tools, Integration, Internet of Things, Security and Identity, Starter Kits, Web and Mobile. At the bottom of the sidebar, there is a link to "Web and Application". The URL "https://console.bluemix.net/catalog/services/cloud-object-storage" is visible at the very bottom of the page.

- Click on the **Create** button

IBM Cloud Object Storage is a highly scalable cloud storage service, designed for high durability, resiliency and security. Store, manage and access your data via our self-service portal and RESTful APIs. Connect applications directly to Cloud Object Storage use other IBM Cloud Services with your data.

[View Docs](#) [Terms](#)

AUTHOR IBM
PUBLISHED 06/25/2018
TYPE Service

Service name:

Select a resource group:

Features

- Storage for the IBM Cloud
- IAM Policies - Bucket level access management

Need Help? [Contact IBM Cloud Support](#) [Estimate Monthly Cost](#) [Cost Calculator](#)

[Create](#)

Create a Watson Studio service instance

- Create a **Watson Studio** service instance from the [IBM Cloud Catalog](#)
- Search on **Studio** in the IBM Cloud Catalog
- Click on the **Watson Studio** service tile

Catalog

All Categories (4) >

Filter

AI

Knowledge Studio
Lite • IBM

Build custom models to teach Watson the language of your domain.

Natural Language Understanding
Lite • IBM

Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more.

Watson Studio
Lite • IBM

Embed AI and machine learning into your business. Create custom models using your own data.

Compute
Containers
Networking
Storage
AI (3)
Analytics (1)
Databases
Developer Tools
Integration
Internet of Things
Security and Identity
Starter Kits

<https://console.bluemix.net/catalog/services/watson-studio>

IBM Cloud Catalog Docs Support Manage

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.

Service name: Watson Studio-jk

Choose a region/location to deploy in: US South Select a resource group: default

FEEDBACK

[View Docs](#) [Terms](#)

AUTHOR IBM PUBLISHED 08/01/2018 TYPE Service

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.

Need Help? [Contact IBM Cloud Support](#) Estimate Monthly Cost [Cost Calculator](#) Create

- Click on the **Create** button
- After the Watson Studio service is created, click on **Get Started** or visit Watson Studio at <https://dataplatform.cloud.ibm.com/>

IBM Cloud Catalog Docs Support Manage

Watson / Watson Studio-ge

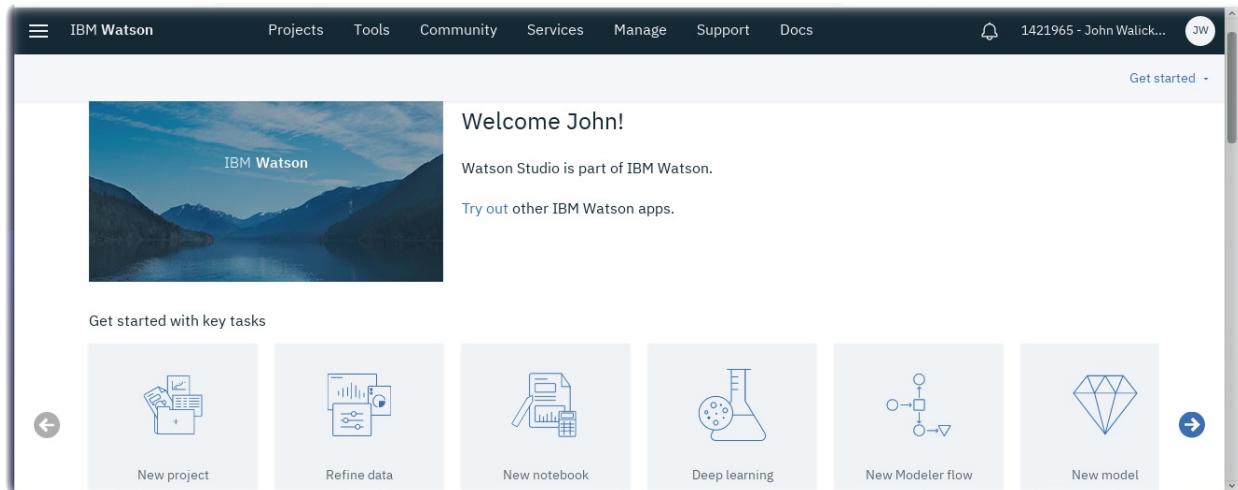
Resource Group: default Location: US South

Watson Studio

Welcome to Watson Studio. Let's get started!

Get Started

- Login with your IBM Cloud account
- Walk through the introductory tutorial to learn about Watson Studio

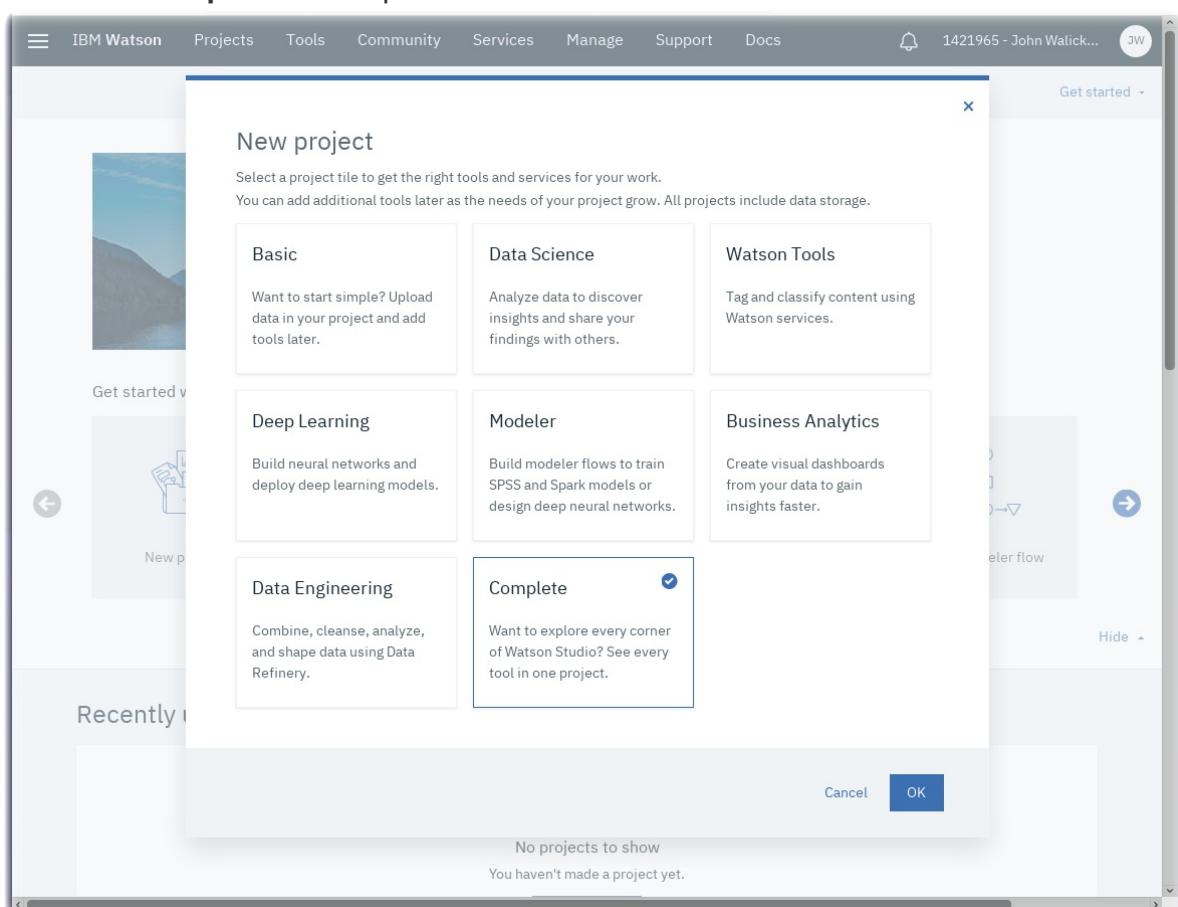


Watson Studio Projects

Projects are your workspace to organize your resources, such as assets like data, collaborators, and analytic tools like notebooks and models

Create a New Project

- Click on **New project**
- Select the **Complete** tile and press the **OK** button



- Give your Project a name : **Scotland**
- The Cloud Object Storage instance created in an earlier step should be prefilled
- Press the **Create** button

The screenshot shows the 'New project' creation interface in IBM Watson Studio. The top navigation bar includes links for Projects, Tools, Community, Services, Manage, Support, and Docs, along with a user account section for John Walicki's Account.

The main form is titled 'New project' and contains two main sections:

- Define project details**:
 - Name: Scotland (highlighted with a red box)
 - Description: Project description (with a character count of 3000)
- Storage**: A dropdown menu showing 'cloud-object-storage-dsx'.

Below these sections is a 'Choose project options' area with a checkbox for 'Restrict who can be a collaborator' (unchecked) and a note stating 'Project will include integration with Cloud Object Storage for storing project assets.'

At the bottom right of the form are 'Cancel' and 'Create' buttons, with the 'Create' button highlighted by a red box.

You are ready to set up your Project with Watson Visual Recognition. Proceed to the next [step](#)

Visual Recognition Model Lab Objectives

In this lab you will create a Visual Recognition model in a Watson Studio Project. You will learn:

- How to work within a new Watson Studio Project
- How to create a Visual Recognition model

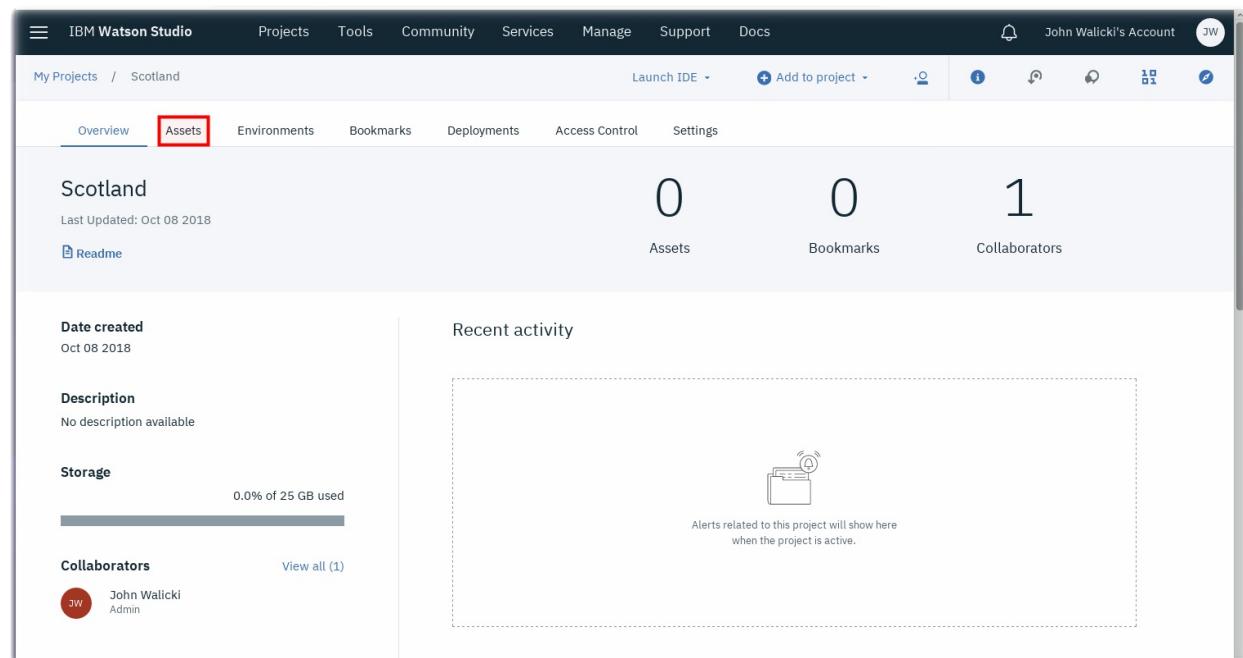
Watson Studio Projects

Projects are your workspace to organize your resources, such as assets like data, collaborators, and analytic tools like notebooks and models.

The first step is to add Assets to your Watson Studio Project

Add Assets to your Watson Studio Project

- Click on the **Assets** tab



The screenshot shows the IBM Watson Studio interface. At the top, there is a navigation bar with links for Projects, Tools, Community, Services, Manage, Support, and Docs. On the far right, it shows "John Walicki's Account" with a profile icon. Below the navigation bar, there is a header with "My Projects / Scotland". A red box highlights the "Assets" tab in the top navigation bar. The main content area displays a project named "Scotland". It shows statistics: 0 Assets, 0 Bookmarks, and 1 Collaborator. Below this, there is a "Recent activity" section which is currently empty. On the left side, there are details about the project: Date created (Oct 08 2018), Description (No description available), Storage (0.0% of 25 GB used), and Collaborators (John Walicki, Admin). A "View all (1)" link is also present.

Create a New Visual Recognition model

- Click on New Visual Recognition model

The screenshot shows the IBM Watson Studio interface. At the top, there's a navigation bar with 'IBM Watson Studio' and links for 'Projects', 'Tools', 'Community', 'Services', 'Manage', 'Support', and 'Docs'. On the right, there's a user account section for 'John Walicki's Account' with a 'JW' icon.

The main content area has a breadcrumb path 'My Projects / Scotland'. It includes a 'Launch IDE' button, an 'Add to project' dropdown, and several small icons for notifications and sharing.

Below the breadcrumb, there's a navigation bar with tabs: 'Overview' (selected), 'Assets' (highlighted in blue), 'Environments', 'Bookmarks', 'Deployments', 'Access Control', and 'Settings'. To the right of this bar is a 'Load' button, 'Files' tab, and 'Catalog' tab.

The 'Assets' section contains a search bar with the placeholder 'What assets are you looking for?' and a 'Data assets' section. The 'Data assets' section has a table header with columns: NAME, TYPE, SERVICE, CREATED BY, LAST MODIFIED, and ACTIONS. Below the header, a message says 'You don't have any Data assets yet.'

The 'Models' section is expanded, showing two sub-sections: 'Natural Language Classifier models' and 'Visual Recognition models'. The 'Natural Language Classifier models' section has a table header and a message 'You don't have any Natural Language Classifier models yet.'. The 'Visual Recognition models' section has a table header and a red box around the '+ New Visual Recognition model' button. Below the header, a message says 'You don't have any Visual Recognition models yet.'

Provision a new Watson Visual Recognition Service instance

- Your project needs to be associated with a Watson Visual Recognition Service instance
 - Click on the **click here** link in the popup to provision a new service

IBM Watson Projects Tools Community Services Manage Support Docs John Walick's Account

Default Custom Model

My classes (1) All images (0)

Drag and drop zip files from your project.

1 class | 0 incomplete classes | 0 unclassified image

Associate a service

Your project needs to be associated with a Watson Visual Recognition service.

To provision a new service or associate an existing one, [click here](#).

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

Create a class

Negative (recommended) 0 images

Train Model [\(i\)](#)

Search classes

Total file size: 0.0/250 MB

Let's talk

Create a Watson Visual Recognition Service

- Select the **Lite** plan and note the features
- Scroll to the bottom and click on the **Create** button

The screenshot shows the IBM Watson Visual Recognition service creation interface. At the top, there's a navigation bar with links for Projects, Tools, Community, Services, Manage, Support, and Docs. A user account is also visible. Below the navigation, the main title is "Visual Recognition". Underneath, there are two tabs: "Existing" and "New", with "New" being selected. A section titled "Visual Recognition" contains a brief description of the service's purpose: "Find meaning in visual content! Analyze images for scenes, objects, faces, and other content. Choose a default model off the shelf, or create your own custom classifier. Develop smart applications that analyze the visual content of images or video frames to understand what is happening in a scene." To the right of this text are four feature boxes: "General Model", "Food Model", "Custom Model", "Explicit Model", "Face Model", and "Text Model (Private Beta*)". Each box provides a brief description of its function. Below these features, a "Pricing Plan" table compares the "Lite" and "Standard" plans across three columns: PLAN, FEATURES, and PRICING. The "Lite" plan is highlighted with a blue dot. The "Standard" plan is shown below it. At the bottom right of the page, there are "Cancel" and "Create" buttons, with the "Create" button being highlighted by a red rectangle.

PLAN	FEATURES	PRICING
<input checked="" type="radio"/> Lite	1,000 Events per month towards: Pre-trained model classification (General, Face, Food, Explicit) (images) Custom Model classification (images) Custom Model training (images) 2 Custom Models 1 Lite Plan instance per IBM Cloud Organization Free Exports to Core ML	Free
<input type="radio"/> Standard	Image Tagging Events Pay per Use Face Detection Events Pay per Use Training Events Pay per Use Custom Tagging Events Pay per Use Food Tagging Events Pay per Use Explicit Tagging Events Pay per Use	\$0.002 USD/GeneralTagging \$0.004 USD/FaceRecognition \$0.1 USD/Training \$0.002 USD/CustomTagging \$0.002 USD/FoodTagging \$0.002 USD/ExplicitTagging

Rename Visual Recognition Model

- The **Default Custom Model** name is not descriptive so let's rename it
- Click on the **pencil** icon to edit the name

The screenshot shows the IBM Watson Studio interface. At the top, there is a navigation bar with links for Projects, Tools, Community, Services, Manage, Support, and Docs. On the far right, it shows "John Walicki's Account" and a profile icon. Below the navigation bar, the URL "Projects / Scotland / Default Custom Model" is visible. The main content area has a title "Default Custom Model" with a red box around the edit icon. Below the title, it says "Associated Service : watson-vision-combined-jaw". There are two tabs: "My classes (1)" and "All images (0)". A warning message "⚠ At least 2 classes required" is displayed. On the left, there is a placeholder for "Drag and drop files from your project." and a "Create a class" button. On the right, there is a "Search classes" input field and a "Train Model" button. To the right of the main content area, there are two sections: "1. Upload to project" and "2. Add from project".

- Rename the model to **Scotland**

The screenshot shows the IBM Watson Studio interface after renaming the model. The title now reads "Scotland" with the edit icon removed. The "Associated Service : watson-vision-combined-jaw" remains the same. The "My classes (1)" tab is selected, and the "All images (0)" tab is visible. A warning message "⚠ At least 2 classes required" is still present. The "Create a class" button and "Search classes" input field are visible. The "Train Model" button is also present. The "1. Upload to project" and "2. Add from project" sections remain on the right side of the screen.

Add Custom Classes to the Watson Visual Recognition Model

- Click on the + symbol to add a class

The screenshot shows the IBM Watson Studio interface with the project path "Projects / Scotland / Scotland". The main area displays "Scotland" with an associated service "watson-vision-combined-jaw". A "Train Model" button is visible. Below it, there are tabs for "My classes (1)" and "All images (0)". A warning message "At least 2 classes required" is shown. A search bar "Search classes" and a file size indicator "New training data size: 0.0/250 MB" are also present. On the left, a "Create a class" button has a red box around its plus sign. To its right, a "Negative (0)" section is shown with the note "This class is recommended but not required". On the right side, there are two sections: "1. Upload to project" (with a "Browse" button) and "2. Add from project" (which is currently empty). The top navigation bar includes links for Projects, Tools, Community, Services, Manage, Support, and Docs, along with user account information.

- Name this class **Castle**
- Click the **Create** button

This screenshot shows the same interface as above, but the "Create a class" dialog box is open in the center. It contains a text input field with the value "Castle". Below the input field, there are "Cancel" and "Create" buttons. The rest of the interface remains the same, including the "Train Model" button, the "Negative (0)" section, and the "1. Upload to project" and "2. Add from project" sections on the right.

- Add a second custom class by clicking on the + symbol again

The screenshot shows the IBM Watson Studio interface with the 'Scotland' project selected. On the left, there's a sidebar with 'My classes (2)' and 'All images (0)'. In the center, there's a 'Create a class' button with a red box around its '+' icon. To the right, there's a 'Train Model' button and a note saying 'At least 2 classes required'. Below the 'Create a class' button, there's a placeholder 'Drag and drop files from your project.' and a search bar 'Search classes'. On the far right, there are sections for '1. Upload to project' (with a 'Browse' button) and '2. Add from project' (with a note '0 selected').

- Name this class **Black House**
- Click the **Create** button

The screenshot shows the 'Create a class' dialog box open. The class name 'Black House' is entered into the input field. There are 'Cancel' and 'Create' buttons at the bottom. The background shows the 'Scotland' project page with the 'Create a class' button highlighted.

Upload Zip Files to Watson Studio Project

- Three zip files have been prepared which contain aerial drone images
- These zip files are on the local lab workstation
- If you following these steps on the web, download the aerial drone zip files here:
 - [Castles.zip](#)
 - [BlackHouses.zip](#)
 - [Countryside.zip](#)
- Click on the **Browse** button
- An operating system native File Dialog will open
- Multi-select the three zip files **Castles.zip**, **BlackHouses.zip**, **Countryside.zip**
- Upload these zip files to your Watson Studio project

The screenshot shows the IBM Watson Studio interface. The top navigation bar includes 'IBM Watson Studio', 'Projects', 'Tools', 'Community', 'Services', 'Manage', 'Support', 'Docs', and a user account section for 'John Walicki's Account'. The main content area displays the 'Scotland' project page. On the left, there are sections for 'Associated Service : watson-vision-combined-jaw', 'My classes (3)', and 'All images (0)'. Below these are buttons for 'Train Model' and 'Classes are incomplete'. In the center, there's a 'Search classes' input field and a message about new training data size (0.0/250 MB). On the right, a modal window titled '1. Upload to project' is open, featuring a 'Browse' button which is highlighted with a red box. The background of the modal contains instructions: 'To add files to your project, drop .jpeg, .png, or .zip files here or'.

This screenshot shows the same Watson Studio interface as the previous one, but with three zip files now listed in the 'Selected' section of the '1. Upload to project' modal. The files are: 'BlackHouses.zip' (uploaded on 16 Oct 2018 at 12:52:54 pm, 8.89 MB), 'Countryside.zip' (uploaded on 16 Oct 2018 at 12:52:54 pm, 9.01 MB), and 'Castles.zip' (uploaded on 16 Oct 2018 at 12:52:51 pm, 2.2 MB). The 'Browse' button in the modal is also highlighted with a red box.

Drag the zip files to Custom Classes

- Grab the **BlackHouses.zip** from the right navigation and drag it to the **Black House** class

The screenshot shows the IBM Watson Studio interface for a project named 'Scotland'. On the left, there's a sidebar with 'My classes (3)' and 'All images (0)'. The main area displays four classes: 'Create a class' (empty), 'Black House (0)' (with a red arrow pointing to its '+' icon), 'Castle (0)', and 'Negative (0)'. A message at the top right says 'Classes are incomplete'. On the right, a 'Train Model' button is visible, along with a 'Browse' button for adding files. A large panel on the right is titled '1. Upload to project' and '2. Add from project'. Under '2. Add from project', a list shows 'BlackHouses.zip' selected (highlighted with a red box). Other items in the list are 'Countryside.zip' and 'Castles.zip'.

- The images in the zip file will be added to the **Black House** class

This screenshot shows the same interface after the 'BlackHouses.zip' file has been processed. A message at the top left states: 'The images in file BlackHouses.zip have been added to class Black House.' The 'Black House' class now shows '13' images loaded. The 'Train Model' button is now greyed out. The 'Add from project' panel still lists 'BlackHouses.zip' (now 'Loading file into model...'), 'Countryside.zip', and 'Castles.zip'.

- Grab the **Castles.zip** from the right navigation and drag it to the **Castle** class

The Images in file Castles.zip have been added to class Castle.

Scotland

Associated Service : watson-vision-combined-jaw

My classes (3) **All images (33)**

Drag and drop files from your project.

3 classes | 0 incomplete classes | 0 unclassified images

Create a class	Black House (13)	Castle (20) 5/20 images loaded	Negative (0) This class is recommended but not required.

Train Model

Loading images

Search classes

New training data size: 9.1/250 MB

To add files to your project, drop .jpeg, .png, or .zip files here or **Browse**

2. Add from project

Drag .jpeg, .png, or .zip files from your project to the training area to add them to your model.

0 selected

- BlackHouses.zip 16 Oct 2018, 12:52:54 pm 8.89 MB
- Countryside.zip 16 Oct 2018, 12:52:54 pm 9.01 MB
- Castles.zip Loading file into model...

- Grab the **Countryside.zip** from the right navigation and drag it to the **Negative** class

The Images in file Countryside.zip have been added to class Negative.

Scotland

Associated Service : watson-vision-combined-jaw

My classes (3) **All images (45)**

Drag and drop files from your project.

3 classes | 0 incomplete classes | 0 unclassified images

Create a class	Black House (13)	Castle (20)	Negative (12) This class is recommended but not required.

Train Model

Loading images

Search classes

New training data size: 12.3/250 MB

To add files to your project, drop .jpeg, .png, or .zip files here or **Browse**

2. Add from project

Drag .jpeg, .png, or .zip files from your project to the training area to add them to your model.

0 selected

- BlackHouses.zip 16 Oct 2018, 12:52:54 pm 8.89 MB
- Countryside.zip Loading file into model...
- Castles.zip 16 Oct 2018, 12:52:51 pm 2.2 MB

Train your Watson Visual Recognition Custom Classifier

- Click on the **Train Model** button
- Wait a few minutes for the model to train on the images

The screenshot shows the IBM Watson Studio interface for a project titled "Scotland". The top navigation bar includes links for Projects, Tools, Community, Services, Manage, Support, and Docs. A user account for "John Walicki's Account" is visible on the right. The main workspace displays three image classes: "Black House (13)", "Castle (20)", and "Negative (12)". A "Train Model" button is prominently displayed in the top right corner, with a red box highlighting it. To the right of the button, a message says "Ready to train". On the far right, there are sections for "Upload to project" and "Add from project", both with "Browse" buttons.

This screenshot shows the same "Scotland" project in Watson Studio. A message at the top states "Model training started. You will not be able to make changes while this is in progress. We'll notify you once training is complete." A red box highlights this message. The "Training" button is now shown with a yellow triangle icon and the word "Training" next to it, also highlighted with a red box. The rest of the interface, including the image classes and upload sections, remains the same as the first screenshot.

Congratulations

- Once the model has been trained, click on the **Click here** link or the **Trained** link to view and test your model.

The screenshot shows the IBM Watson Studio interface. At the top, the navigation bar includes 'IBM Watson Studio', 'Projects', 'Tools', 'Community', 'Services', 'Manage', 'Support', and 'Docs'. A user account 'John Walicki's Account' is at the top right. The main area displays a success message: 'Training successful Your model training was successful' with a link 'Click here to view and test your model.' This link is highlighted with a red box. Below this, the project name 'Scotland' is shown, along with its associated service 'watson-vision-combined-jaw'. A 'Train Model' button is visible, and a 'Trained' status indicator with a green checkmark and a red box around it is present. On the left, there are sections for 'My classes (3)' and 'All images (45)'. The 'All images' section shows three categories: 'Black House (13)', 'Castle (20)', and 'Negative (12)'. Each category has a preview image and a count. On the right, there's a 'Browse' button for adding files and a '2. Add from project' section listing three zip files: 'Countryside.zip', 'BlackHouses.zip', and 'Castles.zip'. A note says 'This class is recommended but not required.'

Review and Test

- Review the Classes and Model details
- Click on the **Test** tab

The screenshot shows the 'Test' tab selected in the navigation bar of the 'Scotland' project page. The 'Test' tab is highlighted with a red box. The page is divided into sections: 'Summary' and 'Classes'. The 'Summary' section contains a table with model details:

Model ID	Scotland_254945562
Status	Ready
Explanation	This model is ready for use.
Created on	10/16/2018, 1:44:20 PM
Number of classes	2
Number of images	45

The 'Classes' section shows a table of image categories:

CLASS	NUMBER OF EXAMPLES
Black House	13
Castle	20

A 'Search Classes' input field is located at the bottom right of the 'Classes' section.

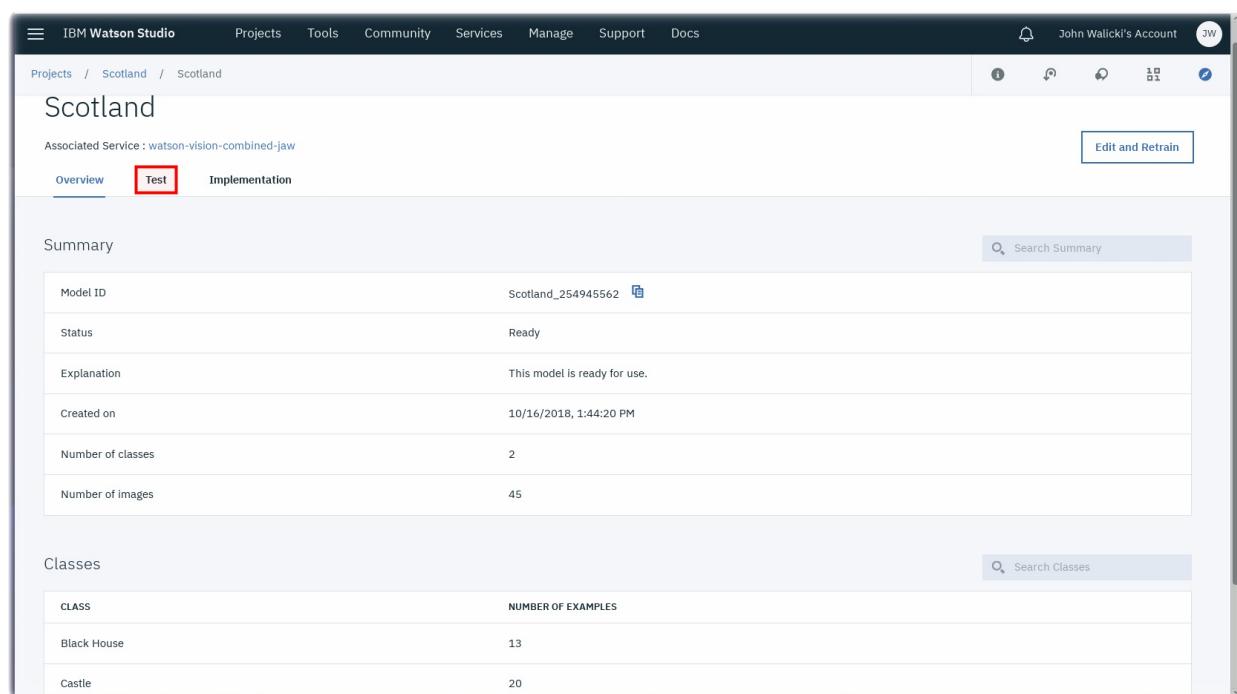
Visual Recognition Test / Deploy Lab Objectives

In this lab you will use sample images to confirm your Visual Recognition model. You will learn:

- How to test your Visual Recognition model using sample images
- How to incorporate your Visual Recognition Custom Classifier model into your applications

Review and Test

- Review the Classes and Model details
- Click on the **Test** tab



The screenshot shows the IBM Watson Studio interface. At the top, there's a navigation bar with links for Projects, Tools, Community, Services, Manage, Support, and Docs. On the right side of the top bar, it says "John Walicki's Account" and has a profile icon. Below the navigation bar, the URL "Projects / Scotland / Scotland" is visible. In the center, there's a card for the "Scotland" project. The card has three tabs: "Overview" (underlined), "Test" (which is highlighted with a red box), and "Implementation". To the right of the tabs is a "Edit and Retrain" button. The "Summary" section contains the following information:

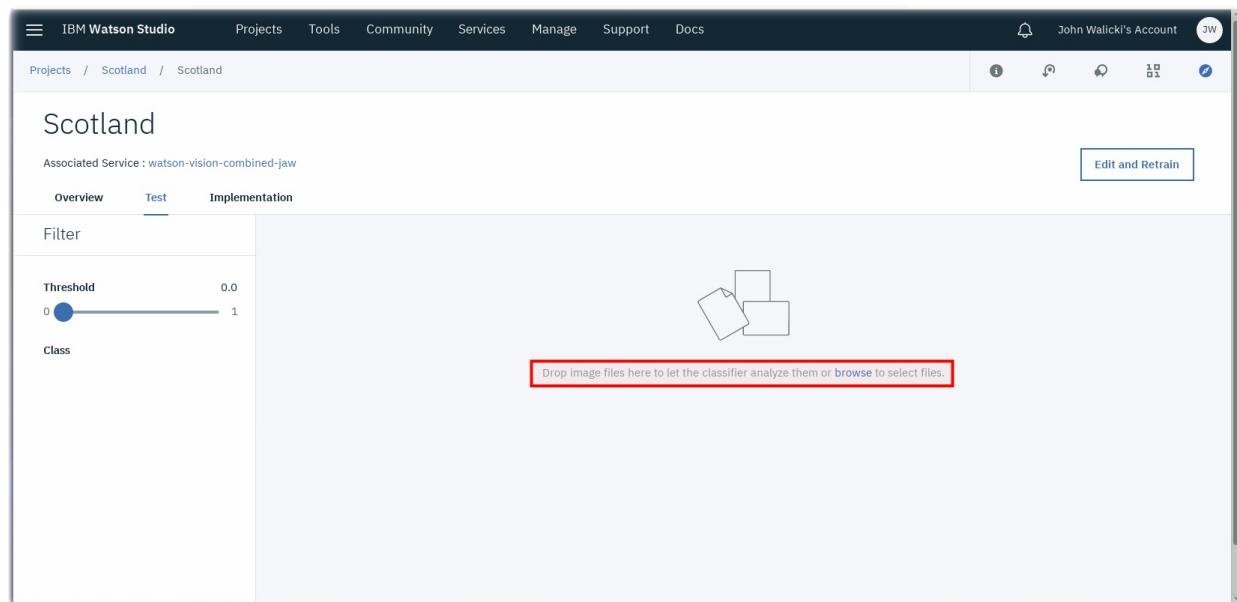
Model ID	Scotland_254945562
Status	Ready
Explanation	This model is ready for use.
Created on	10/16/2018, 1:44:20 PM
Number of classes	2
Number of images	45

Below the summary is a "Classes" section with a "Search Classes" input field. It lists two classes with their respective example counts:

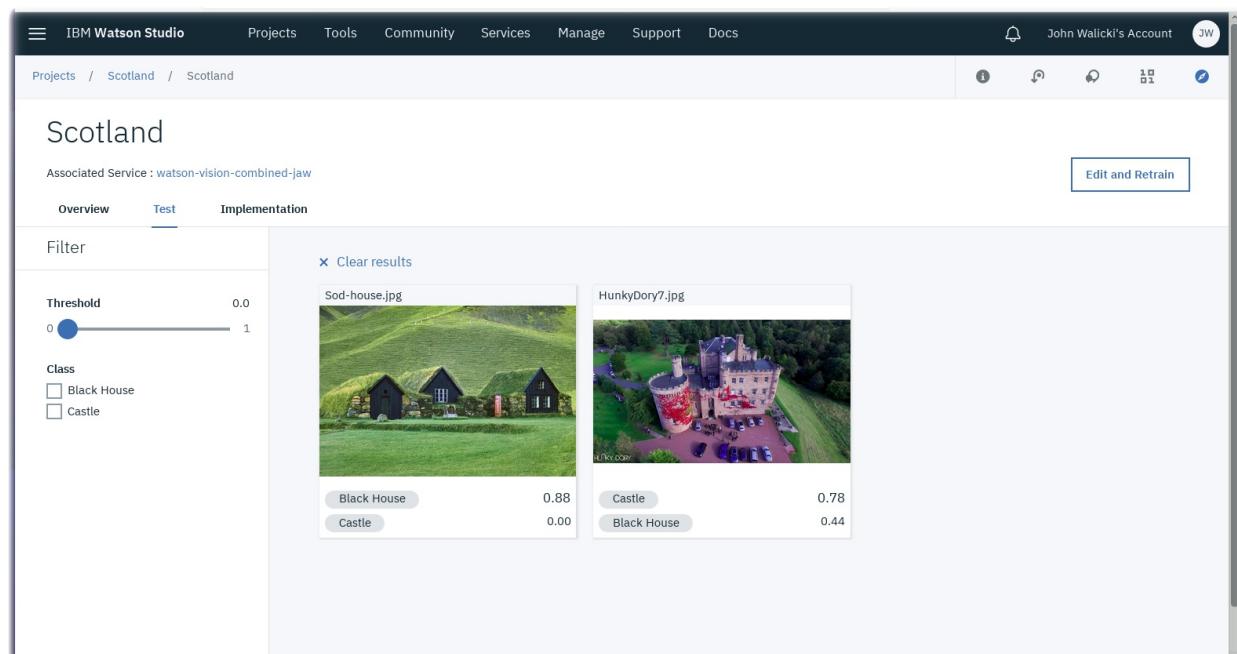
CLASS	NUMBER OF EXAMPLES
Black House	13
Castle	20

Test Watson Visual Recognition Custom Classifier with sample images

- Visit the [Test Data directory](#) and **download** a few of these drone images of Scottish countryside.
- Load the images into the **Test** page by browsing / dragging the images into the Test page



- Inspect the scores returned by the Watson Visual Recognition Custom Classifier



Implement Watson Visual Recognition custom model in your Applications

- You can incorporate this Watson Visual Recognition Custom Classifier model into your applications using a variety of programming languages
- Click on the **Implementation** tab to review the Code snippets

The screenshot shows the IBM Watson Studio interface. At the top, there's a navigation bar with links for Projects, Tools, Community, Services, Manage, Support, and Docs. On the right side of the top bar, there's a user account section for "John Walicki's Account". Below the navigation bar, the main area shows a project titled "Scotland". Underneath the project name, it says "Associated Service : watson-vision-combined-jaw". There are three tabs: Overview, Test, and Implementation, with the Implementation tab being the active one and highlighted with a red box. To the right of the tabs is a "Edit and Retrain" button. On the left, there's a sidebar titled "Code Snippets" with options for cURL, Java, Python, and Node, with "Node" currently selected. The main content area contains code snippets for different programming languages. For Node.js, it shows:

```
npm install --save watson-developer-cloud
```

For Authentication, it shows two snippets:

```
var VisualRecognitionV3 = require('watson-developer-cloud/visual-recognition/v3');

var visualRecognition = new VisualRecognitionV3({
  version: '{version}',
  iam_apikey: '{iam_api_key}'
});
```

```
var VisualRecognitionV3 = require('watson-developer-cloud/visual-recognition/v3');

var visualRecognition = new VisualRecognitionV3({
  version: '{version}',
  api_key: '{api_key}'
});
```

Use the code snippets below to classify images against your model. For reference, the full API specification is available [here](#)

- **API endpoint**

```
https://gateway.watsonplatform.net/visual-recognition/api
```

- **Authentication**

```
curl -u "apikey:{apikey}" "https://gateway.watsonplatform.net/visual-recognition/api/
```

- **Classify an image (GET)**

```
curl -u "apikey:{apikey}" "https://gateway.watsonplatform.net/visual-recognition/api/v
```



- **Classify an image (POST)**

```
curl -X POST -u "apikey:{apikey}" -F "images_file=@fruitbowl.jpg" -F "threshold=0.6" -
```



Congratulations

You have completed the Drone Visual Recognition Lab and have surveyed Scottish countrysides and identified castles and Black houses.

Visual Recognition - Additional References

- Call for Code Visual Recognition
- Identify Cities from Space
- Locate and count items with object detection
- Classify vehicle damage images

Open Source Summit Europe attendees can now ask the IBM booth instructors for a complimentary Drone