

Introduction To Watson Visual Recognition API

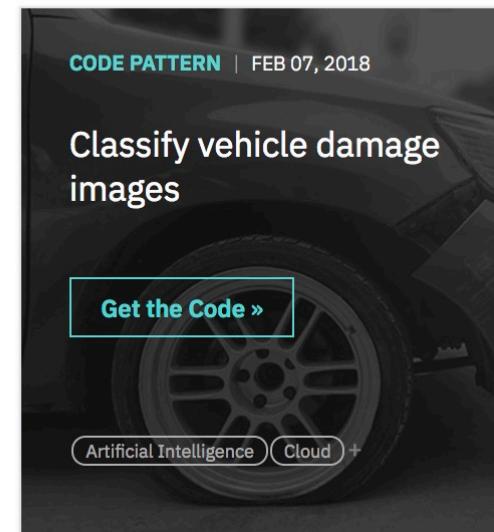
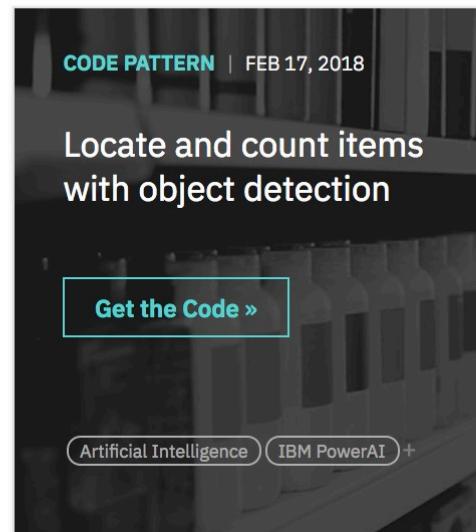
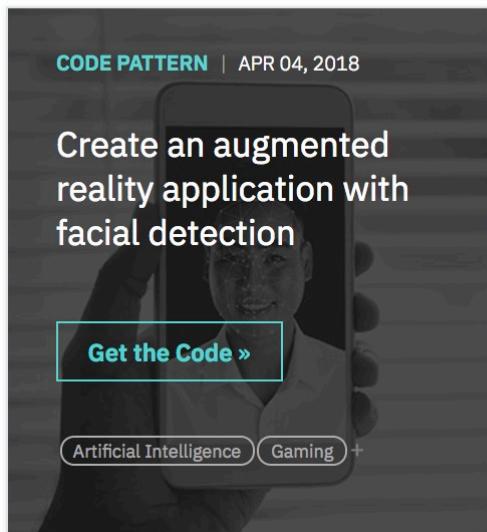
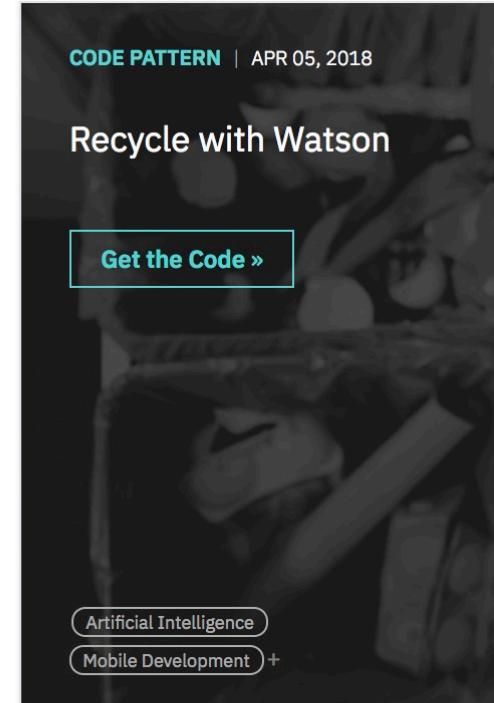
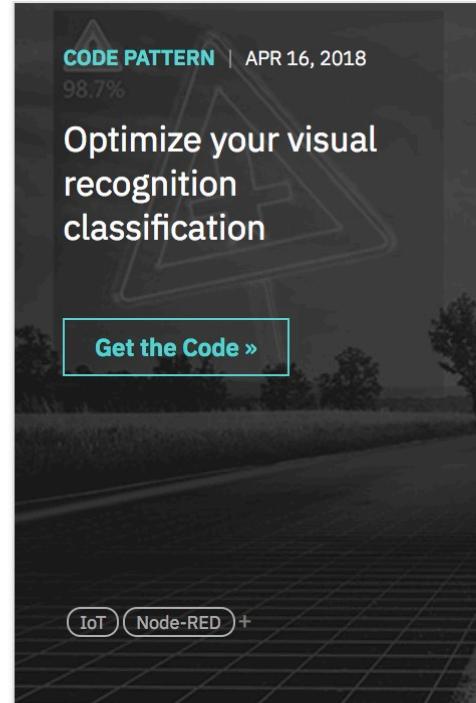
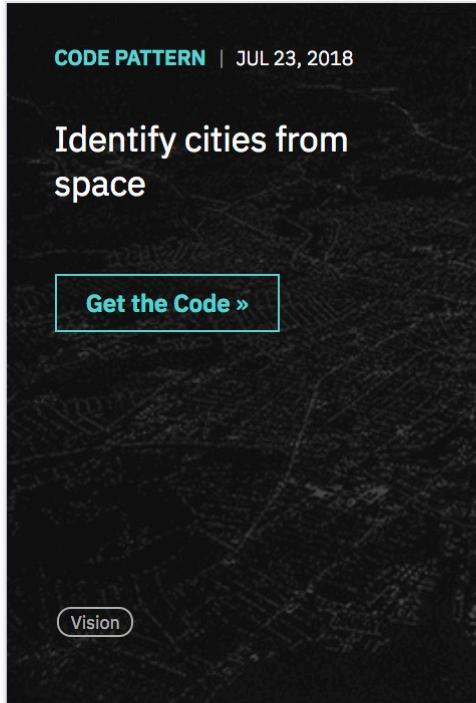
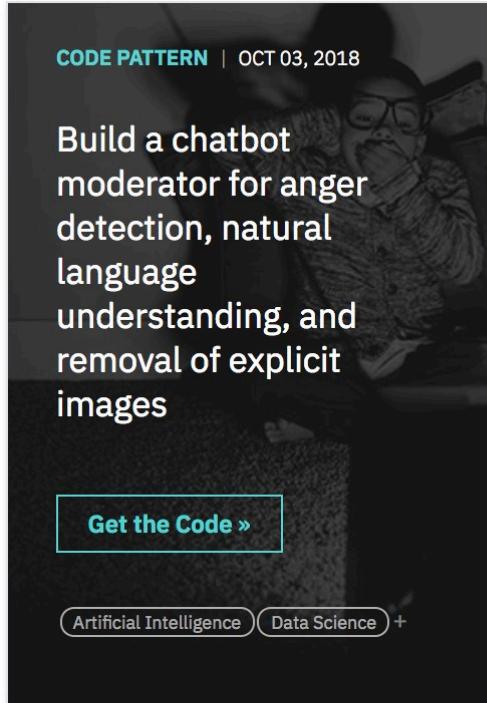
Upkar Lidder, IBM

IBM Code

@lidderupk
<https://github.com/lidderupk/>
ulidder@us.ibm.com

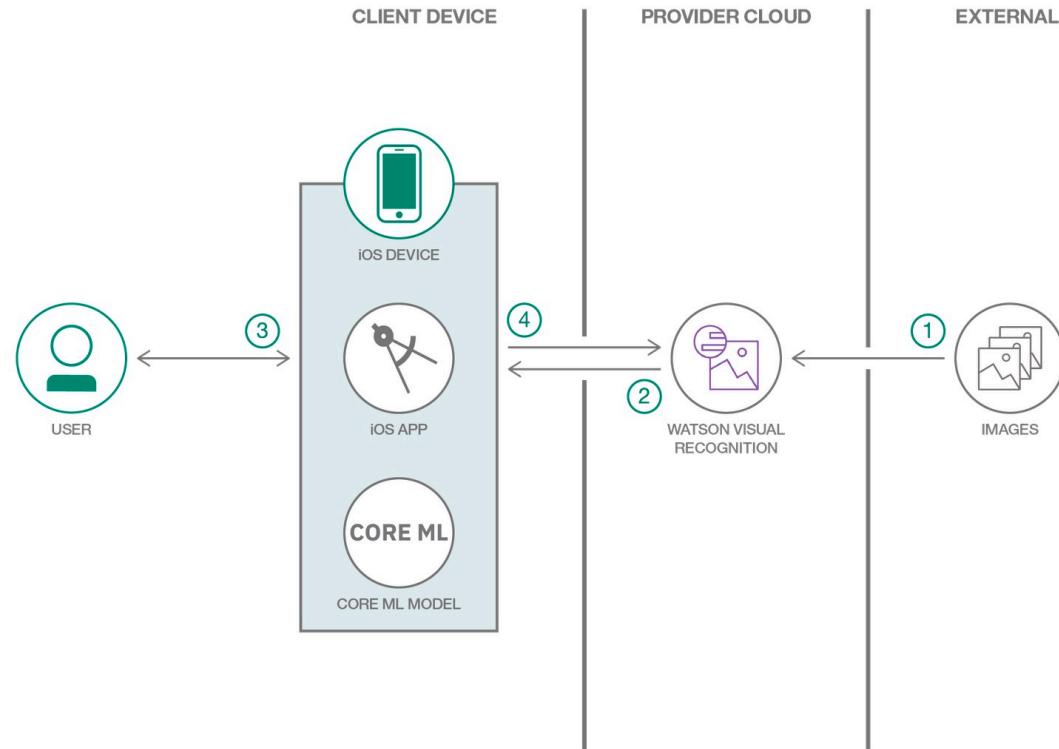
IBM Cloud - <https://ibm.biz/BdYbR8>

IBM Code Patterns - <https://developer.ibm.com/patterns/>



Classify offline with Watson Visual Recognition and Core ML

Flow



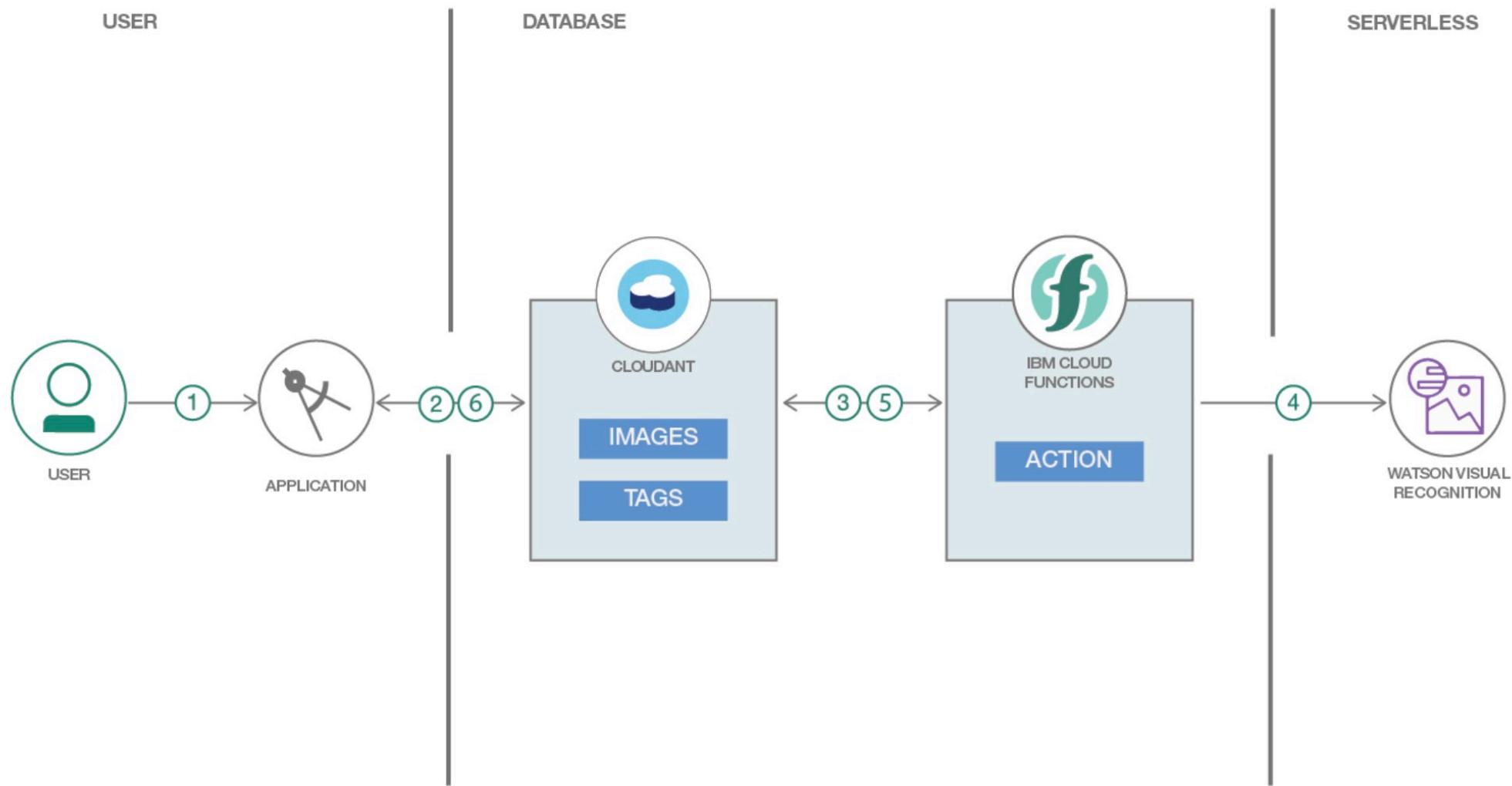
(1) Import and tag images.

(2) Train, test and deploy a Watson Visual Recognition model for Core ML.

(3) Run the application using to classify image using the Core ML model on the device.

(4) Get feedback from the user/device for iterative training in Watson.

Classify offline with Watson Visual Recognition and Core ML



IBM Cloud

Catalog

 Search the catalog...

Filter

All Categories

Compute
Containers
Networking
Storage
AI >

Analytics
Databases
Developer Tools
Integration
Internet of Things
Security and Identity
Starter Kits
Web and Mobile
Web and Application

AI



Watson Assistant (formerly Conversation)

Lite • IBM

Add a natural language interface to your application to automate interactions with your end users. Common applications include virtua...



AI OpenScale

Lite • IBM

IBM AI OpenScale is an enterprise-grade environment for AI infused applications that provides enterprises with visibility into how AI ...



Compare Comply

IBM • Beta

Process governing documents to convert, identify, classify, and compare important elements



Discovery

Lite • IBM

Add a cognitive search and content analytics engine to applications.



Knowledge Catalog

Lite • IBM

Discover, catalog, and securely share enterprise data.



Knowledge Studio

Lite • IBM

Teach Watson the language of your domain.



Language Translator

Lite • IBM

Translate text, documents, and websites from one language to another. Create industry or region-specific translations via the service's...



Machine Learning

Lite • IBM

IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.



Natural Language Classifier

IBM

Natural Language Classifier uses advanced natural language processing and machine learning techniques to create custom...



Natural Language Understanding

Lite • IBM

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



Personality Insights

Lite • IBM

The Watson Personality Insights derives insights from transactional and social media data to identify psychological traits



Text to Speech

Lite • IBM

Synthesizes natural-sounding speech from text.



Tone Analyzer

Lite • IBM

Tone Analyzer uses linguistic analysis to detect three types of tones from communications: emotion, social, and language. This insight can...



Visual Recognition

Lite • IBM

Find meaning in visual content! Analyze images for scenes, objects, faces, and other content. Choose a default model off the shelf, or create...



Watson Studio

Lite • IBM

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

Watson Studio

IBM Watson

UPKAR LIDDER's Acco... UL

Get started ▾



Welcome Upkar!

Watson Studio is part of IBM Watson.

Try out other IBM Watson apps.

Get started with key tasks

New project Refine data New notebook Deep learning Hide ▾

Recently updated projects View all (5) + New project

NAME	ROLE	COLLABORATORS	DATE CREATED	LAST UPDATED
cable-test	Admin	UL	Jul 20, 2018	Jul 20, 2018
medicine-visual-recognition	Admin	UL	Jul 13, 2018	Jul 13, 2018
wildfire	Admin	UL	Jul 12, 2018	Jul 12, 2018
traffic-code-pattern	Admin	UL	Jul 10, 2018	Jul 10, 2018
raspberry-pi	Admin	UL	Jun 26, 2018	Jun 26, 2018

IBM Watson

Projects Tools Community Services Manage Support Docs

Projects / medicine-visual-recognition / Default Custom Model

Get started ▾

Default Custom Model

Associated Service : upkar-watson-medicine-classification

My classes (4) All images (47)

Drag and drop zip files from your project.

4 classes | 0 incomplete classes | 5 unclassified images

Total file size: 70.0/250 MB

Search classes

Create a class

mucinex 19 images

negative (recommended) 0 images

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

nyquil 10 images

vitaminc 13 images

Model is not yet ready to train. Learn why.

Train Model i

1. Upload to project

To add files to your project, drop .zip files here or [Browse](#)

2. Add from project

Drag .zip files from your project to the training area to add them to your model.

0 selected

mucinex.zip 13 Jul 2018, 3:57:06 pm 30.74 MB

nyquil.zip 13 Jul 2018, 3:57:05 pm 16.97 MB

vitaminc.zip 13 Jul 2018, 3:56:23 pm 22.28 MB

IBM Code

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Classifiers/Models

A set of built-in models provides highly accurate results without training:

- General model: Default classification from thousands of classes.
- Face model: Facial analysis with age and gender.
- Explicit model (Beta): Whether an image is inappropriate for general use.
- Food model (Beta): Specifically for images of food items.
- Text model (Private beta): Text extraction from natural scene images.

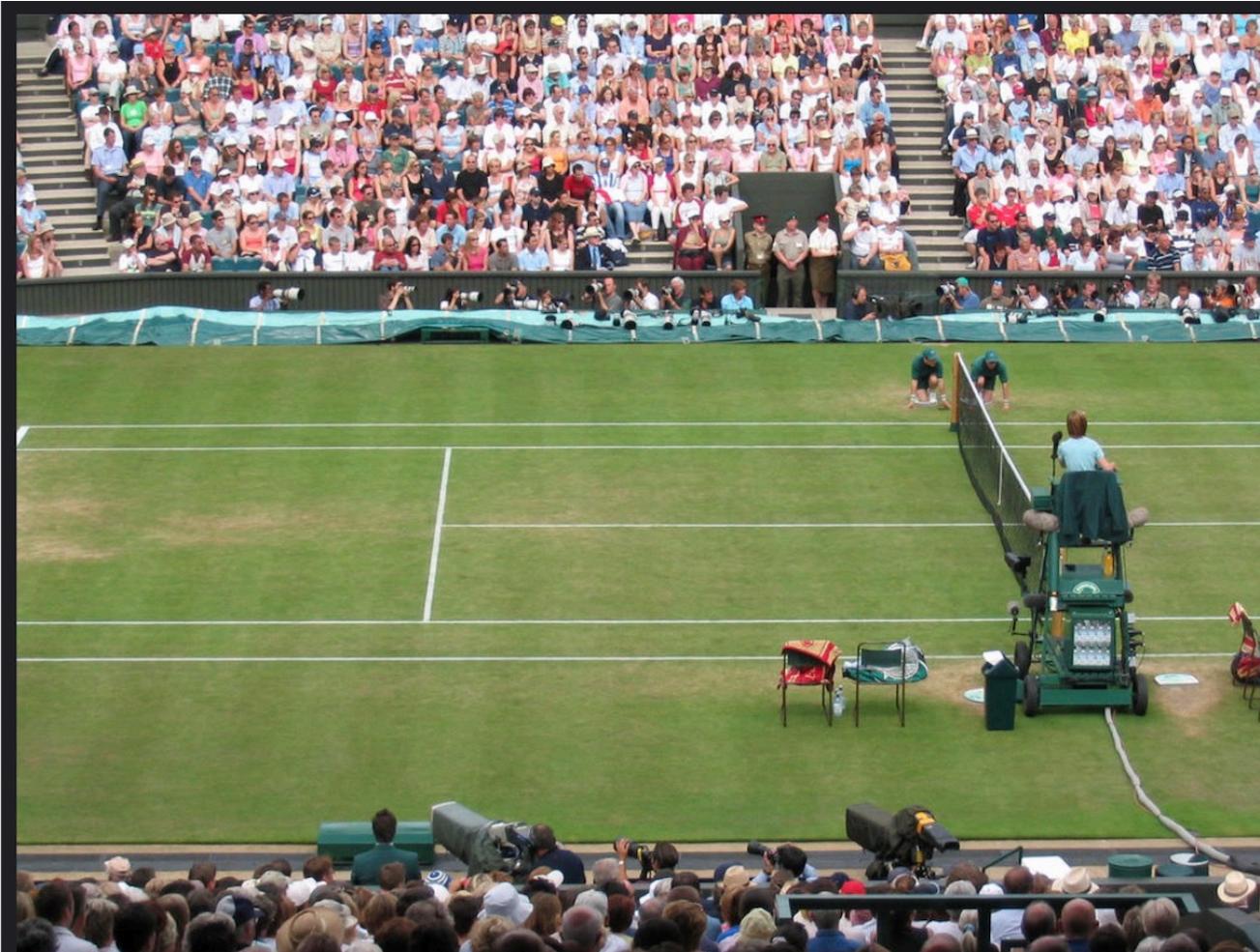
Requires training:

- Custom model: Train a custom classifier by providing positive and negative images.

General Model

- Animals (including birds, reptiles, amphibians, etc.)
- Person and people-oriented information and activities
- Food (including cooked food and beverages)
- Plants (including trees, shrubs, aquatic plants, vegetables)
- Sports
- Nature (including many types of natural formations, geological structures)
- Transportation (land, water, air)
- And many more, including furnishings, fruits, musical instruments, tools, colors, gadgets, devices, instruments, weapons, buildings, structures and man-made objects, clothing and garments, and flowers, among others.

General Model Example



```
{  
  "images": [  
    {  
      "classifiers": [  
        {  
          "classifier_id": "default",  
          "name": "default",  
          "classes": [  
            {  
              "class": "tennis",  
              "score": 0.762,  
              "type_hierarchy": "/sport/athletic game/court game/tennis"  
            },  
            {  
              "class": "court game",  
              "score": 0.774  
            },  
            {  
              "class": "athletic game",  
              "score": 0.779  
            },  
            {  
              "class": "sport",  
              "score": 0.786  
            },  
            {  
              "class": "ballpark",  
              "score": 0.732,  
              "type_hierarchy": "/sports stadium/ballpark"  
            },  
            {  
              "class": "sports stadium",  
              "score": 0.817  
            },  
            {  
              "class": "greenishness color",  
              "score": 0.716  
            }  
          ]  
      },  
      "image": "sport.jpg"  
    ]  
  ],  
  "images_processed": 1,  
  "custom_classes": 0  
}
```

Face Detect



[Photo by Tom Kelly / CC BY](#)

```
{  
  "images": [  
    {  
      "faces": [  
        {  
          "age": {  
            "min": 42,  
            "max": 45,  
            "score": 0.8267146  
          },  
          "face_location": {  
            "height": 240,  
            "width": 198,  
            "left": 587,  
            "top": 258  
          },  
          "gender": {  
            "gender": "MALE",  
            "score": 0.99999547  
          }  
        },  
        {  
          "age": {  
            "min": 20,  
            "max": 22,  
            "score": 0.99971515  
          },  
          "face_location": {  
            "height": 257,  
            "width": 209,  
            "left": 1275,  
            "top": 330  
          },  
          "gender": {  
            "gender": "MALE",  
            "score": 0.9667457  
          }  
        }  
      ]  
    }  
  ],  
  "image": "family.jpg"  
},  
  "images_processed": 1  
}
```

Face Detect



Photo by Alan Kotok / [CC BY](#)

classify

```
{  
  "images": [  
    {  
      "classifiers": [  
        {  
          "classifier_id": "default",  
          "name": "default",  
          "classes": [  
            {  
              "class": "day school",  
              "score": 0.678,  
              "type_hierarchy": "/building/school/day schoo  
            },  
            {  
              "class": "school",  
              "score": 0.678  
            },  
            {  
              "class": "building",  
              "score": 0.678  
            },  
            {  
              "class": "claret red color",  
              "score": 0.733  
            },  
            {  
              "class": "alizarine red color",  
              "score": 0.672  
            }  
          ]  
        },  
        {"image": "cuba.jpg"}  
      ],  
      "images_processed": 1,  
      "custom_classes": 0  
    }  
  ]  
}
```

detect_faces

```
{  
  "images": [  
    {  
      "faces": [  
        {  
          "age": {  
            "min": 0,  
            "max": 12,  
            "score": 0.36798656  
          },  
          "face_location": {  
            "height": 129,  
            "width": 103,  
            "left": 1229,  
            "top": 352  
          },  
          "gender": {  
            "gender": "MALE",  
            "score": 0.68076503  
          }  
        },  
        {  
          "age": {  
            "min": 54,  
            "max": 57,  
            "score": 0.79777867  
          },  
          "face_location": {  
            "height": 86,  
            "width": 75,  
            "left": 995,  
            "top": 76  
          },  
          "gender": {  
            "gender": "MALE",  
            "score": 0.96644753  
          }  
        }  
      ]  
    }  
  ]  
}
```

Food

classifier_ids=""



[Photo](#) by [Lola Williams](#) / [CC BY](#)

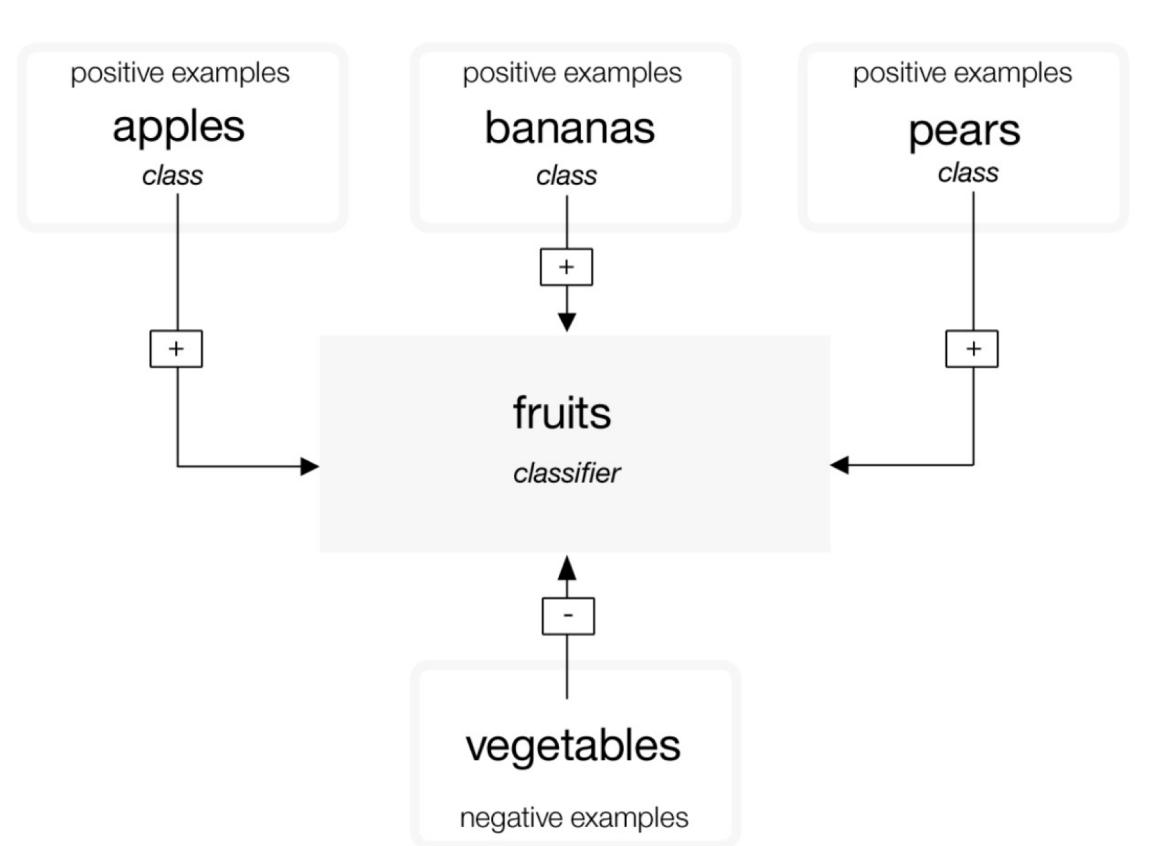
```
{  
  "images": [  
    {  
      "classifiers": [  
        {  
          "classifier_id": "default",  
          "name": "default",  
          "classes": [  
            {  
              "class": "plant",  
              "score": 0.631  
            },  
            {  
              "class": "berry",  
              "score": 0.6  
            },  
            {  
              "class": "dark red color",  
              "score": 0.911  
            }  
          ]  
        },  
        {"image": "fruit2.jpg"}  
      ],  
      "images_processed": 1,  
      "custom_classes": 0  
    }  
  ]  
}
```

classifier_ids=food

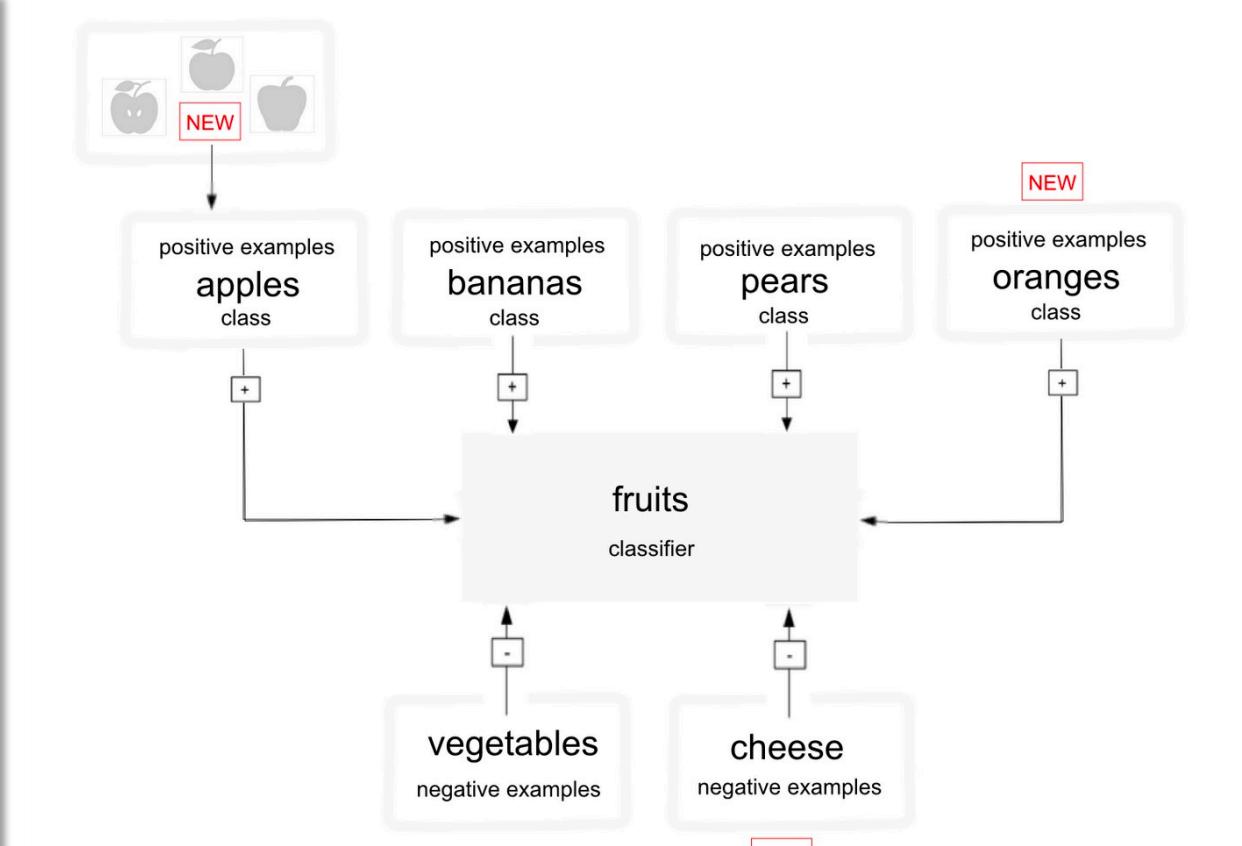
```
{  
  "images": [  
    {  
      "classifiers": [  
        {  
          "classifier_id": "food",  
          "name": "food",  
          "classes": [  
            {  
              "class": "raspberry",  
              "score": 0.934,  
              "type_hierarchy": "/fruit/berry/raspberry"  
            },  
            {  
              "class": "berry",  
              "score": 0.95  
            },  
            {  
              "class": "fruit",  
              "score": 0.95  
            }  
          ]  
        },  
        {"image": "fruit2.jpg"}  
      ],  
      "images_processed": 1,  
      "custom_classes": 0  
    }  
  ]  
}
```

Custom Models

Initial Training



Update Training



Watson API Explorer

Visual Recognition

The IBM Watson™ Visual Recognition service uses deep learning algorithms to identify scenes, objects, and faces in images you upload to the service. You can create and train a custom classifier to identify subjects that suit your needs.

For more information about this service, see the IBM® Cloud docs.

<https://console.bluemix.net/docs/services/visual-recognition/getting-started.html>

General

Show/Hide | List Operations | Expand Operations

GET /v3/classify

Classify an image

POST /v3/classify

Classify images

Face

Show/Hide | List Operations | Expand Operations

GET /v3/detect_faces

Detect faces in an image

POST /v3/detect_faces

Detect faces in images

Custom

Show/Hide | List Operations | Expand Operations

GET /v3/classifiers

Retrieve a list of classifiers

POST /v3/classifiers

Create a classifier

DELETE /v3/classifiers/{classifier_id}

Delete a classifier

GET /v3/classifiers/{classifier_id}

Retrieve classifier details

POST /v3/classifiers/{classifier_id}

Update a classifier

Core ML

Show/Hide | List Operations | Expand Operations

GET /v3/classifiers/{classifier_id}/core_ml_model

Retrieve a Core ML model of a classifier

User data

Show/Hide | List Operations | Expand Operations

DELETE /v3/user_data

Delete labeled data

[BASE URL: /visual-recognition/api , API VERSION: 3.0]

VALID {...}

DEMO

✉ ulidder@us.ibm.com

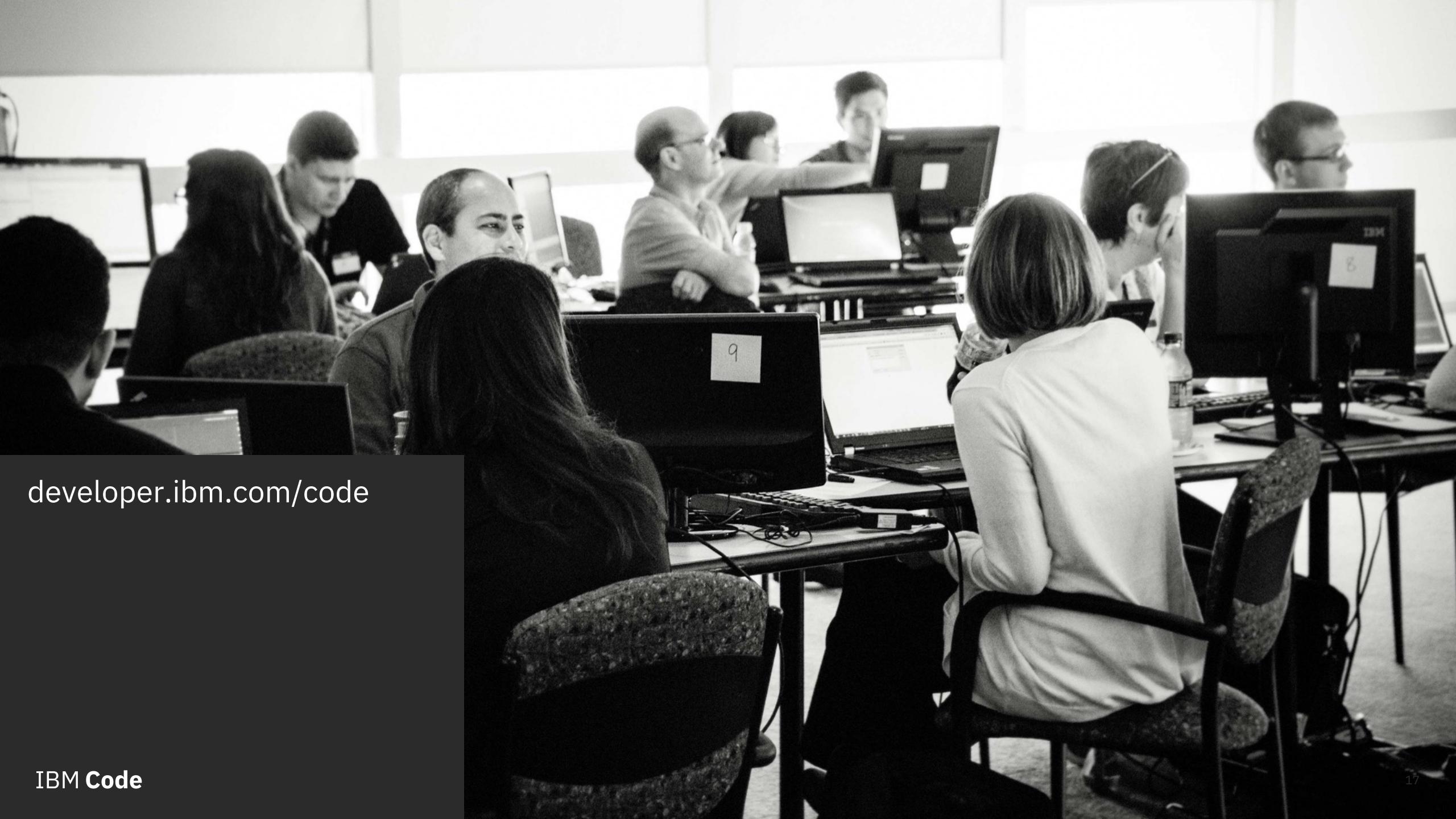
🐦 twitter.com/lidderupk

🐙 github.com/lidderupk



Custom Models - Tips and Tricks

- Provide training examples that are similar to what you plan to analyze.
 - Example: training with tiger in a zoo and then using the model to classify tiger in the wild. The background, surroundings matter, angle, lighting, distance, size of subject, etc matter.
- If the quality and content of training data is the same, then classifiers/classes that are trained on more images will do better.
- Time vs accuracy - the benefits of more images plateaus around 5000 images.
- Parallelize by groups of images. You can train a class asynchronously.
- Recommend 150-200 images per .zip file with image size of 320 x 320. Do not need high resolution.
- Specify only classifiers you want the result for using the “classifier_id” parameter.



developer.ibm.com/code

