Visual Recognition Workshop

Transfert Learning :

Build a custom object detection model leveraging auto labelling capabilities

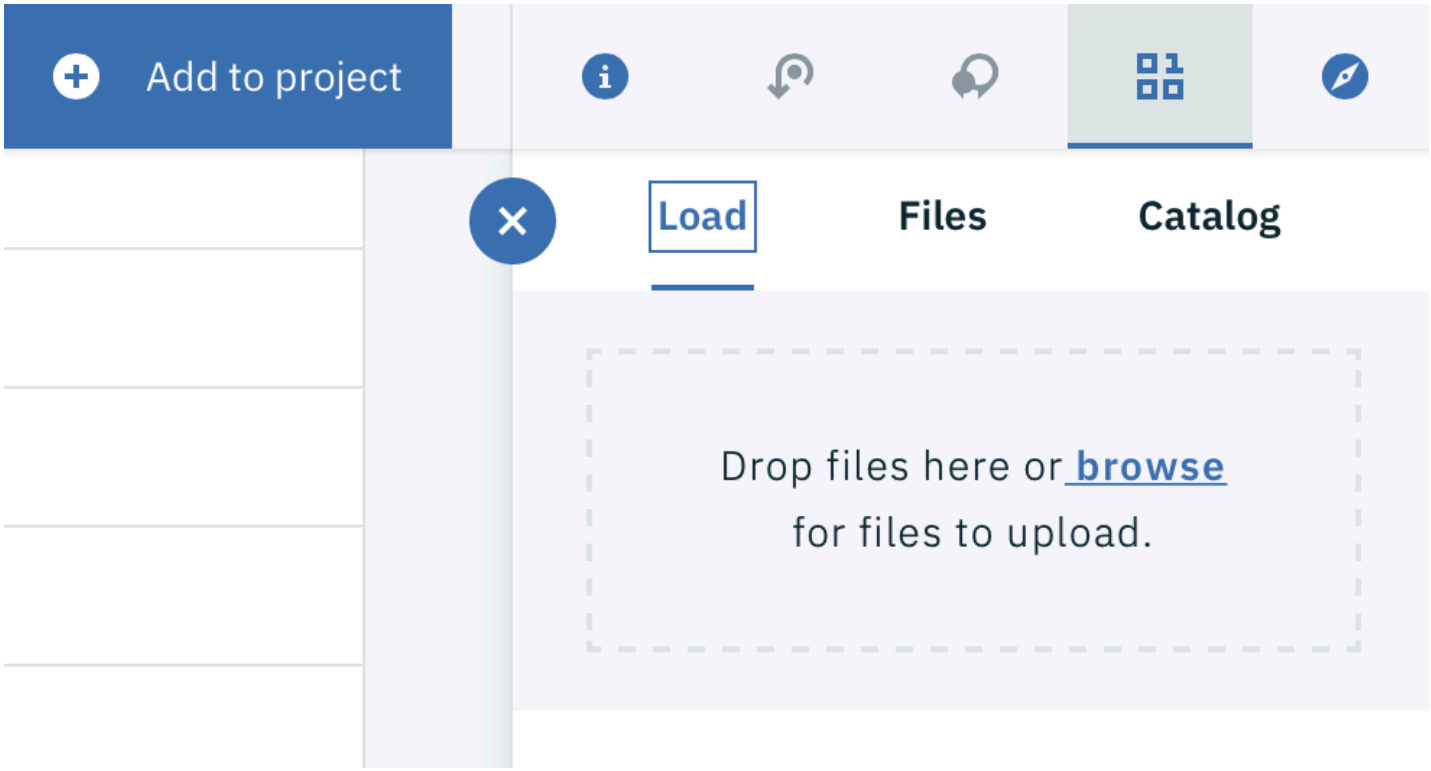
The Visual Recognition service Object detection feature allows you to label some of your images (15+) then create a first model and use it on fresh images and accept/reject objects dynamically detected. Such process is known as Auto Labelling and it improve significantly the timely image labelling process as welle as the targeted accuracy of the model and allows to have huge amount of data made available for the training.

To work on such custom classification we are going to use images to detect skateboard on its.

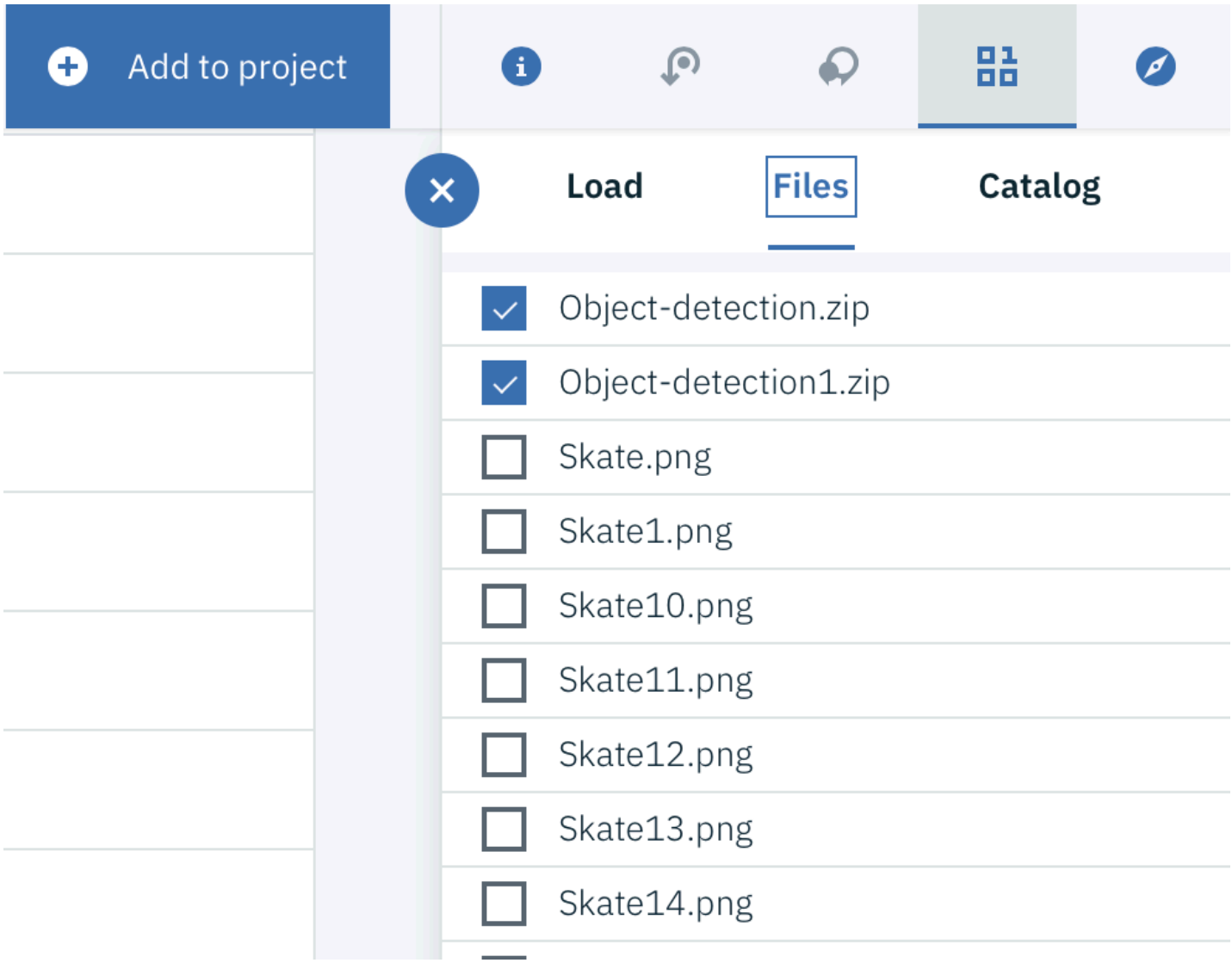
Load your training data

From your project view add to your project repository the **Skate.zip** this file created for you contains 30+ images of various skateboard images. To do so click on the O1 icon and drag a drop the file

Drag & drop these onto your project data set on the right side of the window.



As a result you should get this screen with all images related to skateboard.



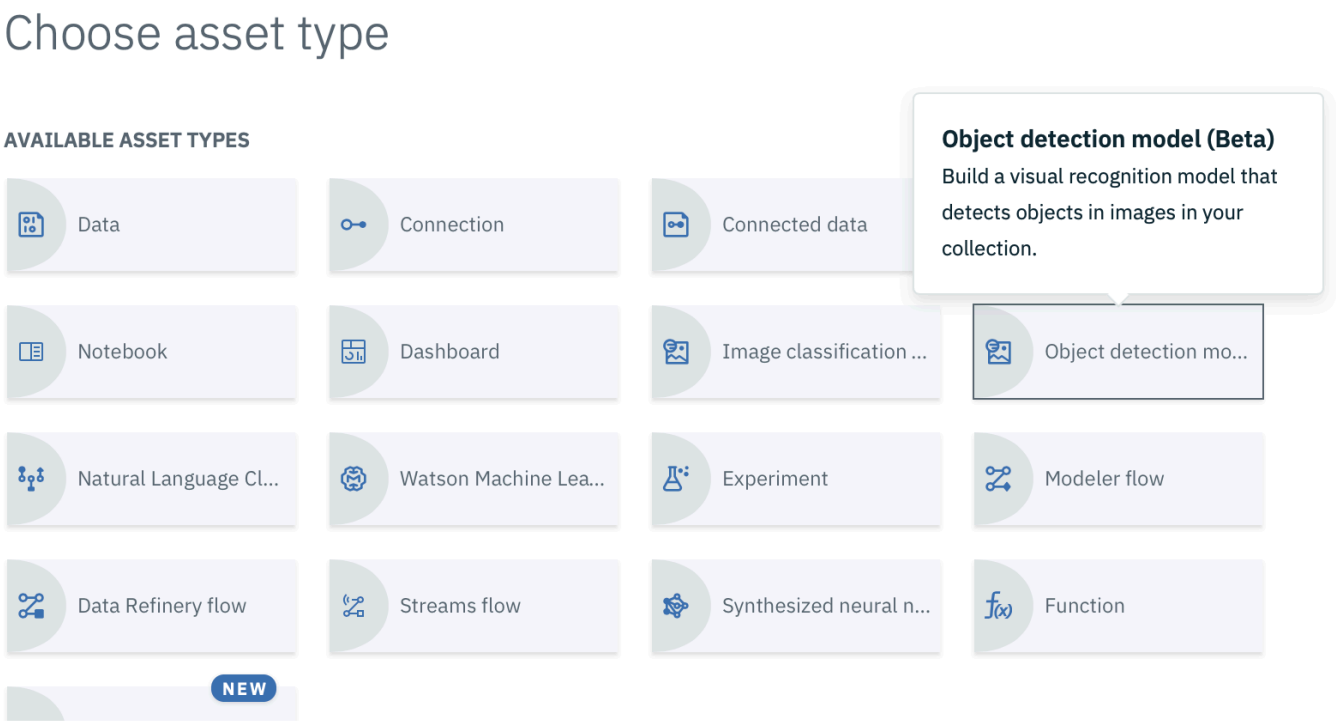
Create if not done a Watson Visual Recognition Service

If you haven't created a Visual Recognition instance yet please do it.

Therefore click the **watson_vision\XXX** (name of your instance) service link to return to the main page of this service.

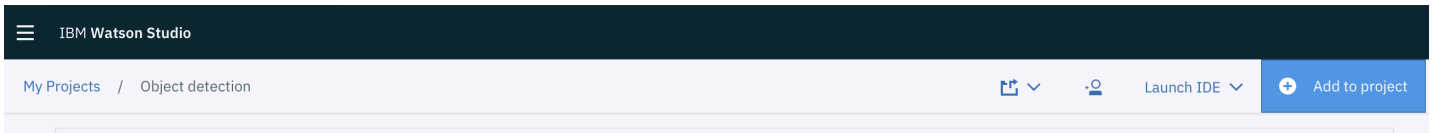
Click on the **Launch Tool** button to open the Visual Recognition service and get an overview of the available pre-trained models.

Click **Object Detection (Beta)** on the **Custom** tileas shown below.



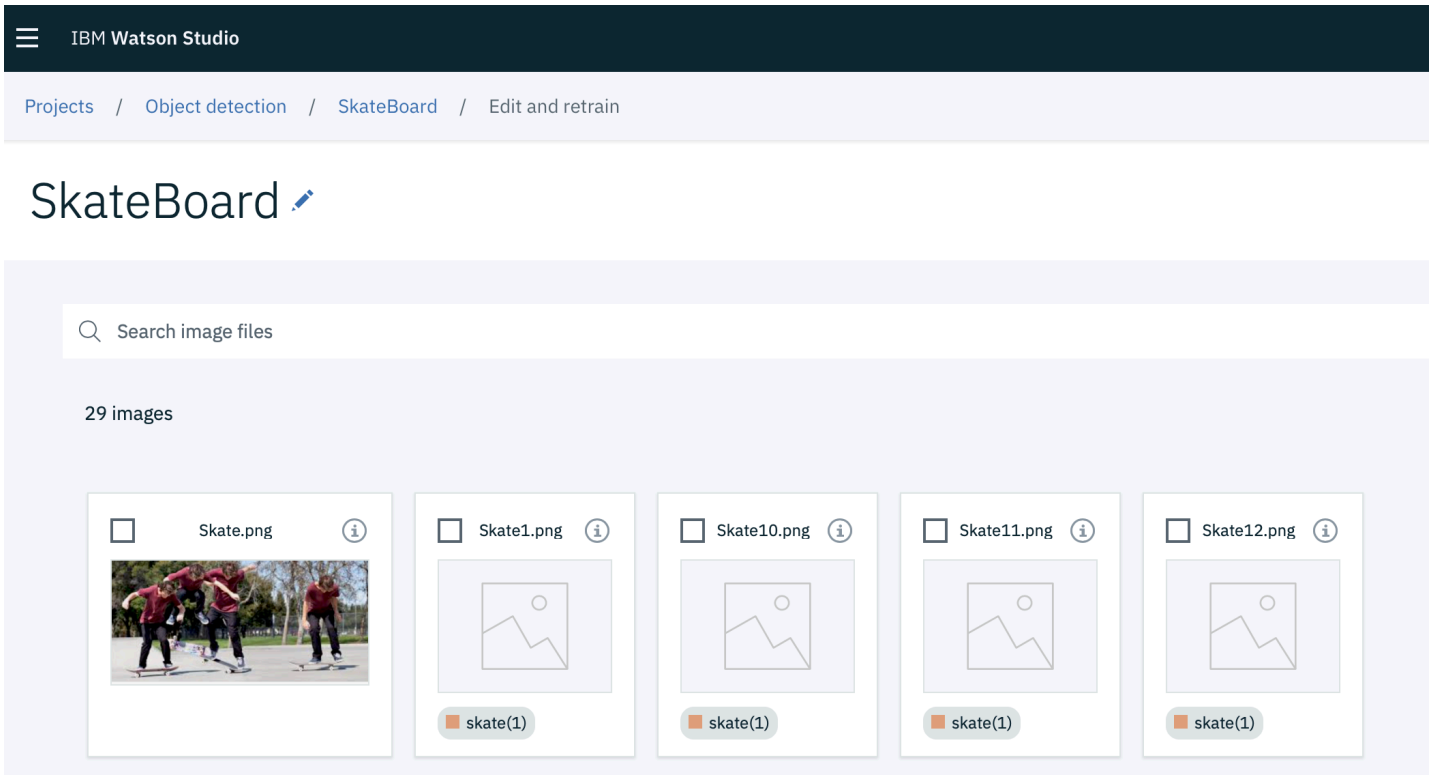
Create your collection & train your Classifier

Guess what you're ready to train you new collection & classifier ! First rename you Collection



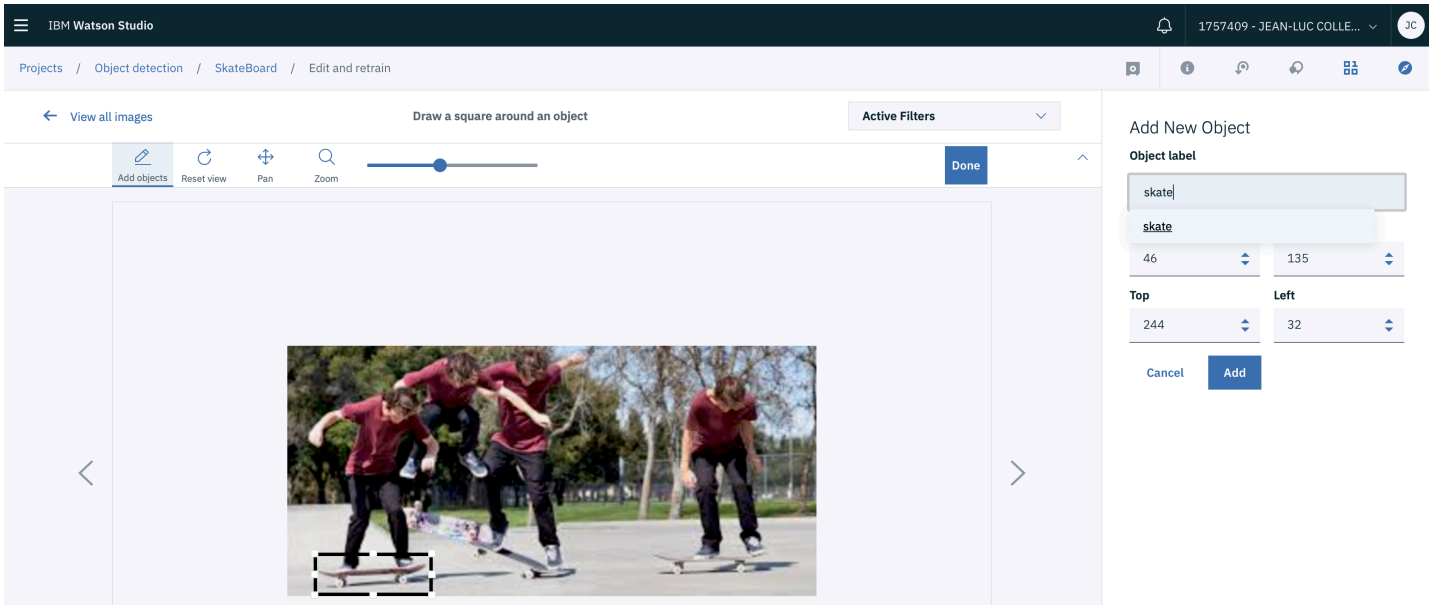
The first task to do now is to add images from the right hand side to your collection (36 images are provided in this lab)

Once done you should see in your collection all images relevant to our skateboard class



Let's start the painfull work and label a few images containing a skateboard. At least 10+ images labelling is required to have good enough model to start with.

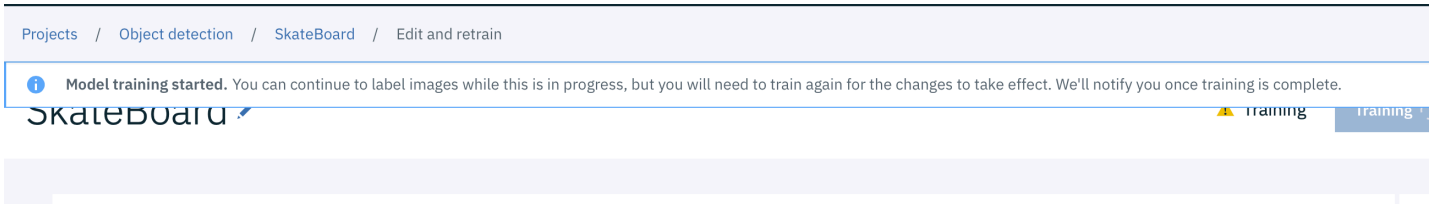
Click on an image and select the **Add Object** then draw the rectangle that isolate the skateboard object in the image click on the add Label on the right side of the screen



Iterate for at least 15+ images

Once done, you can start to train your first iteration of the model to detect skateboard object in images.

Select all labeled images and click the upper right **train** button.



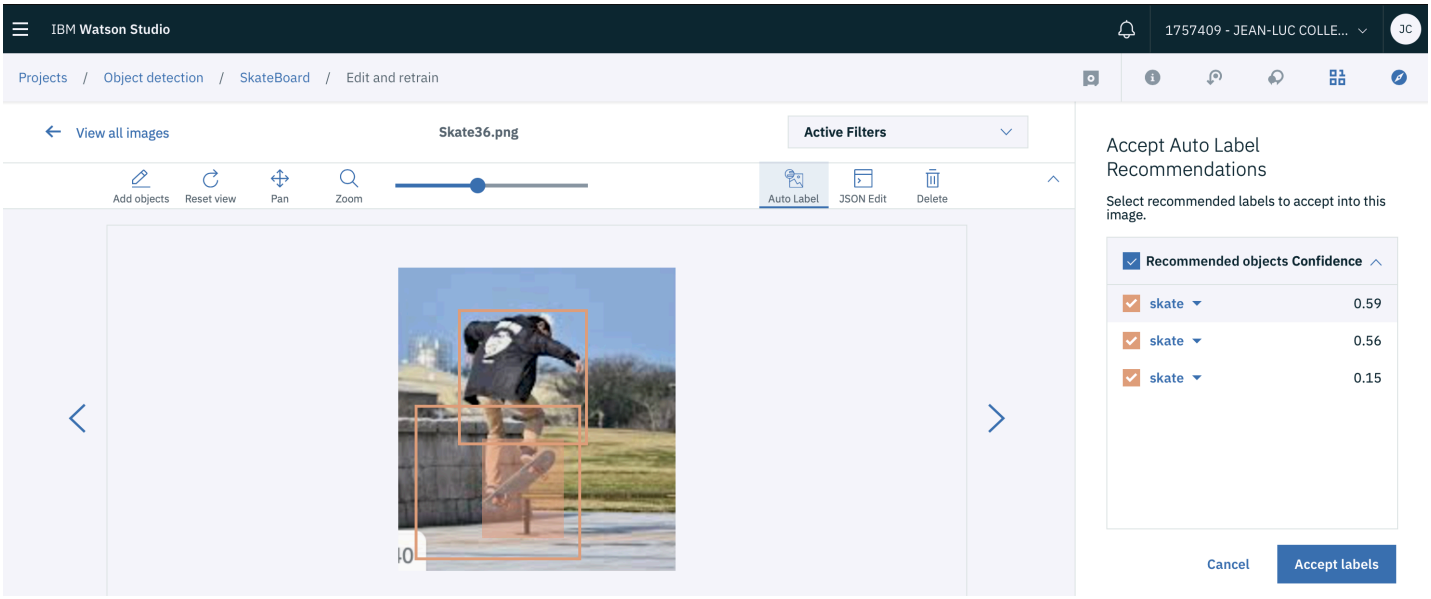
Take a break the cloud Visual Recognition service is working for you to train your classifier Depending on your subscription fee this can take seconds or minutes.

Test the classifier

Now that our first model instance has been trained on your specific images, let's test it.

To do so select one of the fresh images in your collection, by this I mean an image not yet labelled and click on it then you can see an Auto Label button ontop fo it, click on it and see what the trained model is able to detect, if nothing detected then add a new label to this image and it to the collection, if the Auto Labelling detect a skateboard object(s) you can adjust the object isolation and pertinence (remove it if not relevant) and iterate again on a number of new images.

Again after a few iterations retrain your model and use it again for auto labelling and will see a logarythmic increase in term of accuracy of the model. This kind of feature is key to create cost effective & very efficient Deep learning model with unlabelled data.



Even though it might seem like Watson is taking a long time, Watson set a world record for the fastest training of 7.5 million images in 7 hours versus the previous record taking 10 days (i.e. 34 times faster):

http://fortune.com/2017/08/08/ibm-deep-learning-breakthrough/

This is really powerful ! You can train Watson si it recognizes what you want, even if the most obvious object in a picture isn't what you want. Let's say you are in the tire business; most image recognition

software (Watson included) will recognize an automobile image instead of the tires that you care about. Building your custom model will allow you to create a domain specific image recognition service.

Here's another example of a customer using IBM Watson Visual Recognition to detect cell phone tower panels that are in need of repair: https://www.youtube.com/watch?v=BWDfP_udMA0 Most image recognition services might tell you it is a cell tower, but they won't tell you which ones need repair -- this is the power of customized training just for your needs.

Conclusion

This lab demonstrated the power of cognitive computing using IBM's Visual Recognition Service. In just a few minutes, you were able to use existing classification on object detection from the out of the box Watson service and also train it on a custom object recognition pattern. This quick tutorial demonstrated the power of Transfert Learning enabled by IBM Watson. Armed with this powerful technology, you can disrupt your industry in innovative ways that were previously too expensive and time consuming to endeavor.