

## CHAPTER 42

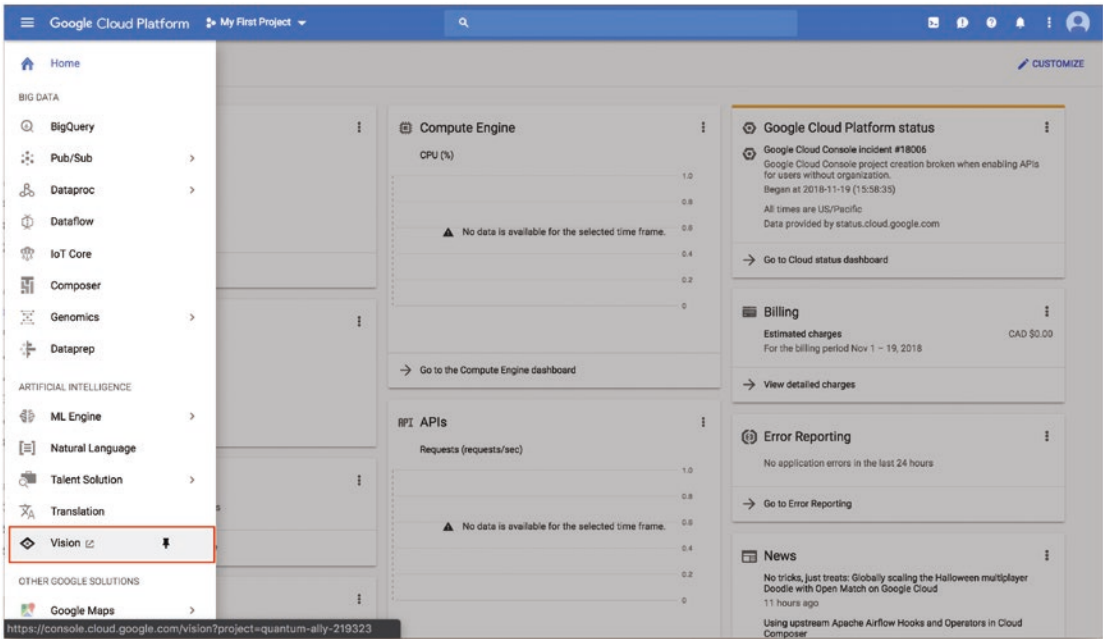
# Google AutoML: Cloud Vision

Google Cloud AutoML Vision facilitates the creation of custom vision models for image recognition use cases. This managed service works with the concepts of transfer learning and neural architecture search under the hood to find the best network architecture and the optimal hyper-parameter configuration of that architecture that minimizes the loss function of the model. This chapter will go through a sample project of building a custom image recognition model using Google Cloud AutoML Vision. In this chapter, we will build an image model to recognize select cereal boxes.

## Enable AutoML Cloud Vision on GCP

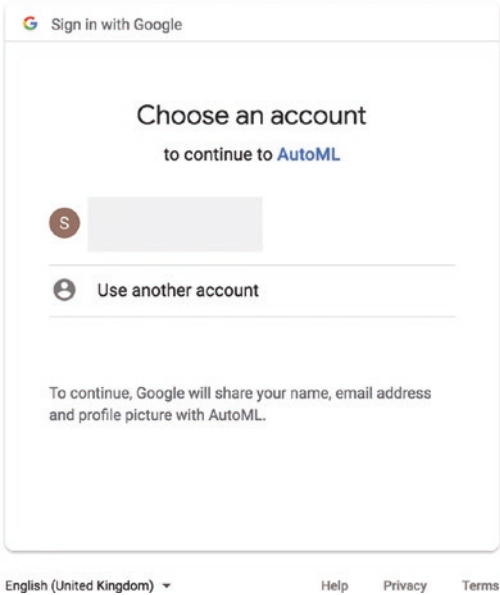
Step through the following steps to enable AutoML Cloud Vision on GCP:

1. Open Cloud Vision by clicking the triple dash at the top-left corner of the GCP dashboard. Select **Vision** under the product section **ARTIFICIAL INTELLIGENCE** as shown in Figure 42-1.

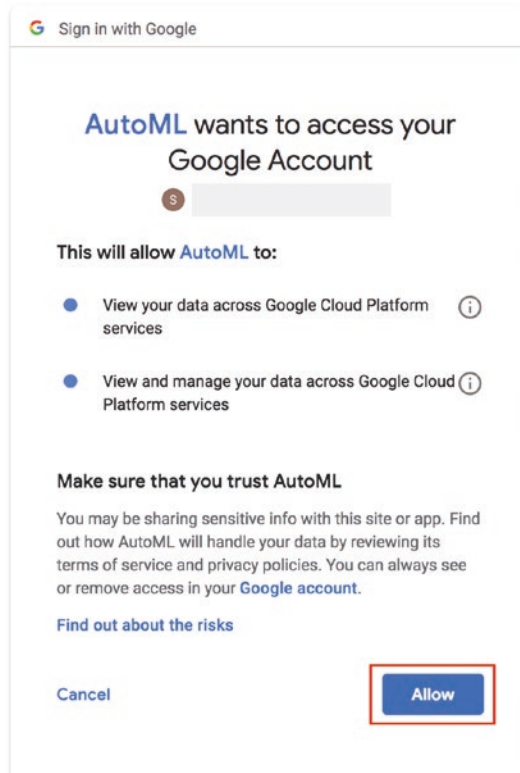


*Figure 42-1. Open Google AutoML: Cloud Vision*

- 2. Select the Google user account on which to activate AutoML as shown in Figures 42-2 and 42-3.

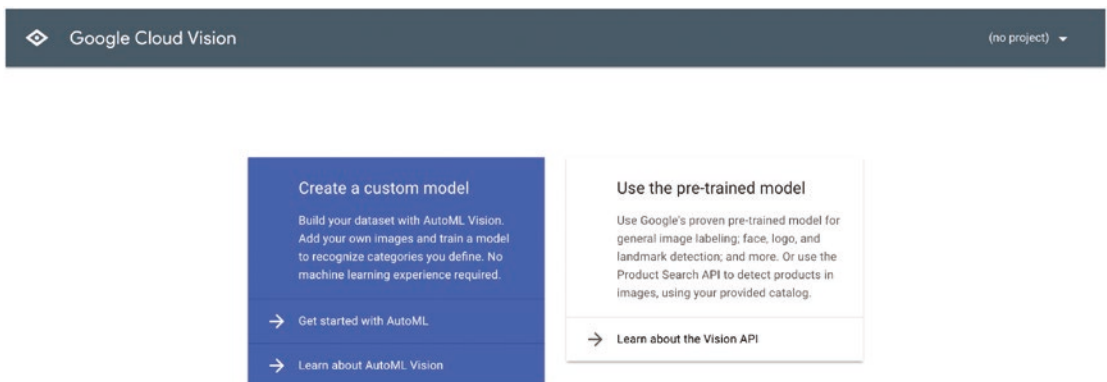


*Figure 42-2. Select account to authenticate AutoML*



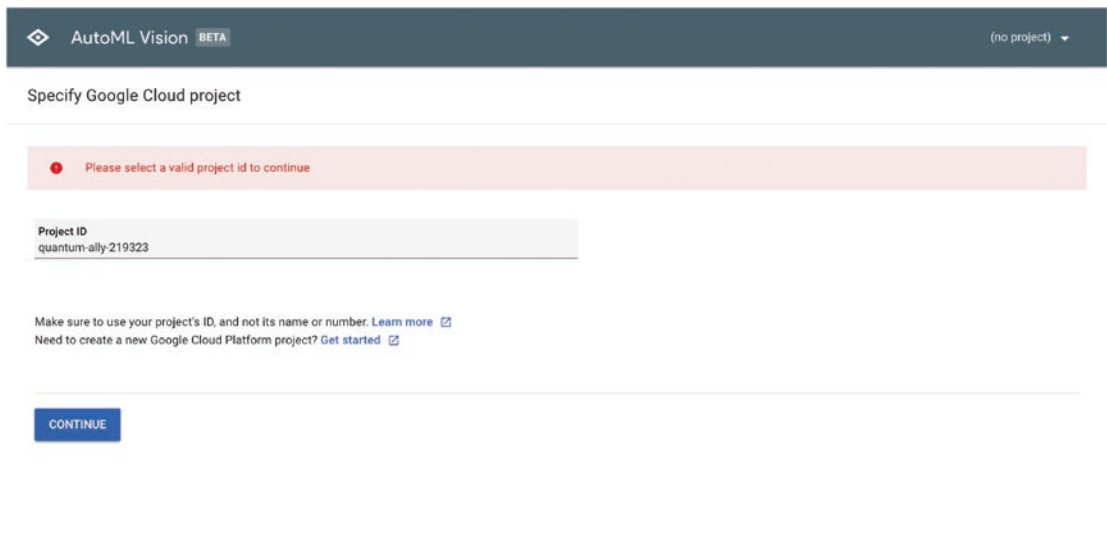
**Figure 42-3.** *Authenticate AutoML*

3. After authentication, the Google Cloud Vision Welcome page opens up (see Figure 42-4).



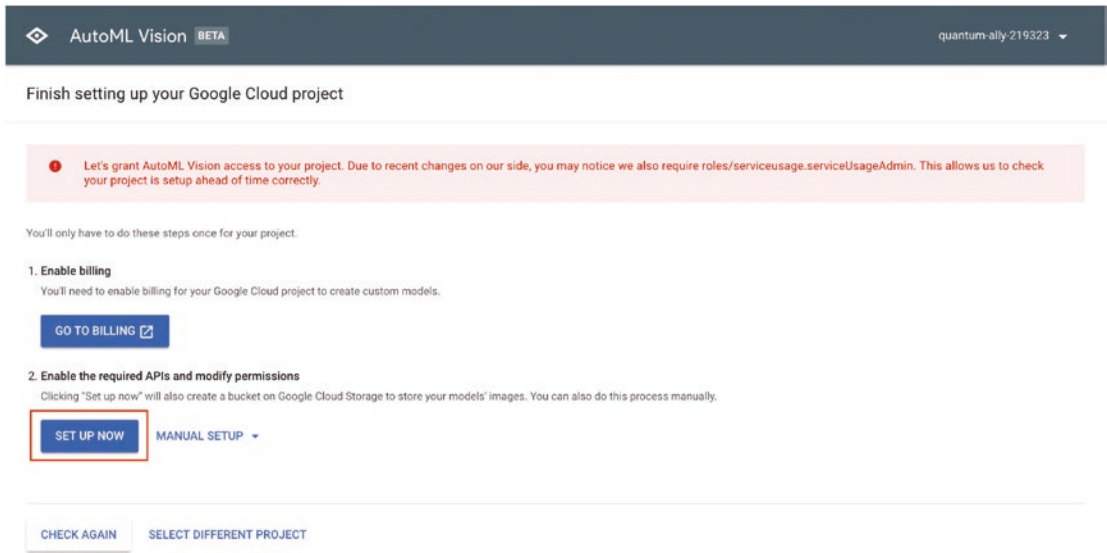
**Figure 42-4.** *Cloud Vision Welcome page*

- 4. From the drop-down menu, select the **Project ID** (with billing enabled) that will be used to set up AutoML (see Figure 42-5).



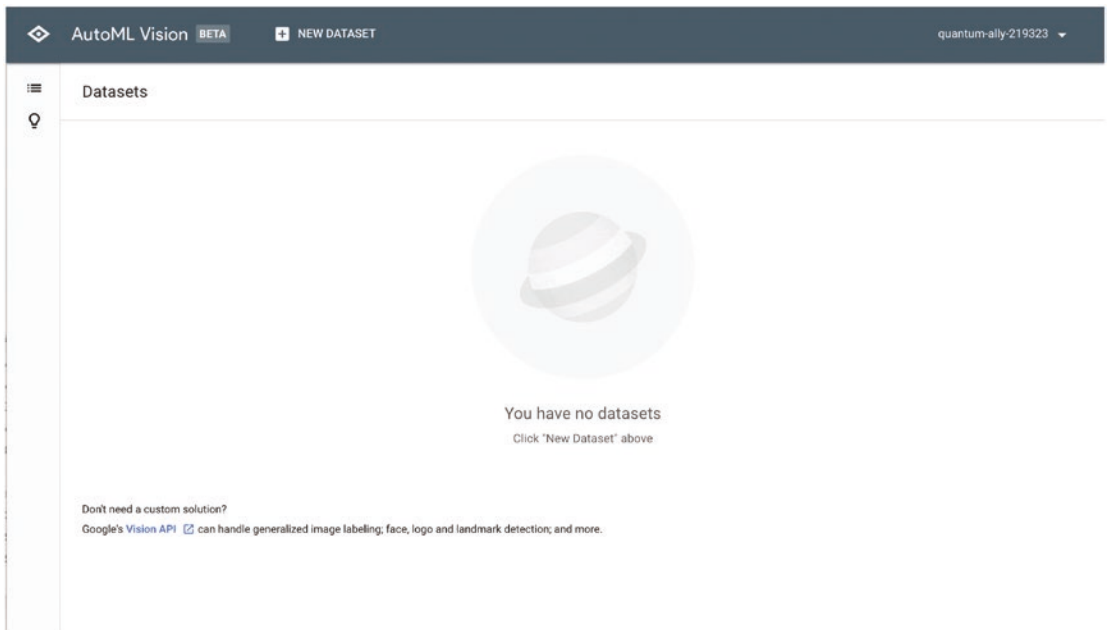
**Figure 42-5.** *Select Project ID for configuring AutoML*

- 5. The final configuration step is to enable the AutoML API on the GCP project and to create a GCS bucket for storing the output models. Click **‘SET UP NOW’** to automatically complete the configuration as shown in Figure 42-6.



**Figure 42-6.** Automatically complete AutoML configuration

6. When the configuration is complete, the AutoML Vision Dashboard is activated (see Figure 42-7).



**Figure 42-7.** Automatically complete AutoML configuration

## Preparing the Training Dataset

Before building a custom image recognition model with AutoML Cloud Vision, the dataset must be prepared in a particular format; they include

1. For training, JPEG, PNG, WEBP, GIF, BMP, TIFF, and ICO image formats are supported with a maximum size of 30mb per image.
2. For inference, the image formats JPEG, PNG, and GIF are supported with each image being of maximum size 1.5mb.
3. It is best to place each image category into containing sub-folder within an image folder For example:
  - [image-directory]
    - [image-class-1-dir]
    - [image-class-2-dir]
    - ...
    - [image-class-n-dir]
4. Next, a CSV must be created that points to the paths of the images and their corresponding label. AutoML uses the CSV file to point to the location of the training images and their labels. The CSV file is placed in the same GCS bucket containing the image files. Use the bucket automatically created when AutoML Vision was configured. In our case, this bucket is named 'gs://quantum-ally-219323-vcml'. We use the following code segment to create the CSV file used in the cereal classifier example.

```
import os
import numpy as np
import pandas as pd

directory = 'cereal_photos/'

data = []

# go through sub-directories in the image directory and get the
image paths
```