Cloud AutoML Vision

Creating datasets and importing images

A dataset contains representative samples of the type of content you want to classify, labeled with the category labels you want your custom model to use. The dataset serves as the input for training a model.

The main steps for building a dataset are:

1. Create a dataset (#create-dataset) and specify whether to allow multiple labels on each item.

2. Import data items (#import-data) into the dataset.

3. Label the items (#label-items).

In many cases, steps 2 and 3 are combined: you import data items with their labels already assigned.

Creating a dataset

The first step in creating a custom model is to create an empty dataset that will eventually hold the training data for the model. When you create a dataset, you specify the type of classification you want your custom model to perform:

- MULTICLASS assigns a single label to each classified image
- MULTILABEL allows an image to be assigned multiple labels

As of the v1 version of the AutoML API this request returns the ID of a long-running operation.

After the long-running operation completes you can import images into it. The newly created dataset doesn't contain any data until you import images into it.

Save the dataset ID of the new dataset (from the response) for use with other operations, such as importing images into your dataset and training a model.
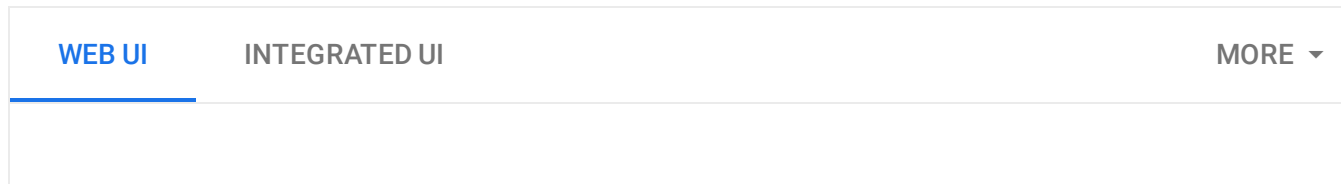
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Note: Starting September 2019 we will start migrating AutoML Vision users to a new user interface that may affect the steps in this operation. This migration will occur in an on-going basis. See the "**Integrated UI**" tab for instructions using the updated interface.

The AutoML Vision UI enables you to create a new dataset and import items into it from the same page. If you would rather import items later, select **Import images later** at step 3 below.

1. Open the AutoML Vision UI (https://console.cloud.google.com/vision).

   The **Datasets** page shows the status of previously created datasets for the current project.

	Name	ID ⑦	Type	Total images	Labeled images	Last updated	Status	
✅	clothes_multi_label	ICN4245971651916051926	Multi-label	2079	2079	Mar 21, 2019, 9:48 AM	Success: Training vision classification edge model	⋮
↖	flowers_test	ICN7659310489748753267	Single-label	3667	3667	Mar 21, 2019, 9:33 AM	Training vision classification edge model	⋮
⚠	flowers_no_and_multi_label	ICN8623122158368509225	Multi-label	3667	3662	Sep 10, 2018, 12:45 PM	Duplicated files detected	⋮

   To add a dataset for a different project, select the project from the drop-down list in the upper right of the title bar.

2. Click the **New Dataset** button in the title bar.

3. On the **Create dataset** page, enter a name for the dataset and specify where to find the labeled images to use for training the model.

   You can:

   - Upload a .csv file that contains the training images and their associated category labels from your local computer or from Google Cloud Storage.

   - Upload a collection of .txt or .zip files that contain the training images from your local computer.

   - Postpone uploading images and labels until later. Use this option for manual labeling through the UI.

4. Specify whether to enable multi-label classification.

   Click the check box if you want the model to assign multiple labels to a document.

5. Click **Create dataset**.

   You're returned to the **Datasets** page; your dataset will show an in progress animation while your documents are being imported. This process should take approximately 10 minutes per 1000 documents, but may take more or less time.

   If the service returns a 405 error, reduce the number of documents you're uploading at once. You'll need to refresh the page before trying again.

Importing items into a dataset

After you have created a dataset, you can import item URIs and labels for items from a CSV file stored in a Google Cloud Storage bucket. For details on preparing your data and creating a CSV file for import, see Preparing your training data
 (https://cloud.google.com/vision/automl/docs/prepare).

You can import items into an empty dataset or import additional items into an existing dataset.

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The AutoML Vision UI enables you to create a new dataset and import items into it from the same page; see Creating a dataset (#create-dataset). The steps below import items into an existing dataset.

1. Open the AutoML Vision UI (https://console.cloud.google.com/vision) and select the dataset from the **Datasets** page.

2. On the **Images** page, click **Add items** in the title bar and select the import method from the drop-down list.

   You can:

   - Upload a .csv file that contains the training images and their associated category labels from your local computer or from Google Cloud Storage.
   - Upload .txt or .zip files that contain the training images from your local computer.

3. Select the file(s) to import.

Labeling training items

To be useful for training a model, each item in a dataset must have at least one category label assigned to it. AutoML Vision ignores items without a category label. You can provide labels for your training items in three ways:

- Include labels in your .csv file

- Label your items in the AutoML Vision UI

- Request labeling from human labeling service such as Google AI Platform Data Labeling Service (https://cloud.google.com/vision/automl/docs/human-labeling).

The AutoML API does not include methods for labeling.

Known issue: Some datasets cannot be displayed in the Safari browser. Please try Google Chrome in that case.

For details about labeling items in your .csv file, see Preparing your training data (https://cloud.google.com/vision/automl/docs/prepare).

To label items in the AutoML Vision UI (https://console.cloud.google.com/vision), select the dataset from the dataset listing page to see its details. The display name of the selected dataset appears in the title bar, and the page lists the individual items in the dataset along with their labels. The navigation bar along the left summarizes the number of labeled and unlabeled items and enables you to filter the item list by label.

To assign labels to unlabeled items or change item labels, select the items you want to update and the label(s) you want to assign to them.

Request labeling

You can leverage Google's AI Platform Data Labeling Service (https://console.cloud.google.com/data-labeling) service to label your images. See the product documentation (https://cloud.google.com/data-labeling/docs/) for more information.

Getting the status of an operation

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Before using any of the request data below, make the following replacements:

- **project-id**: your GCP project ID.

- **operation-id**: the ID of your operation. The ID is the last element of the name of your operation. For example:

- operation name: projects/***project-id***/locations/***location-
  id***/operations/**IOD5281059901324392598**
- operation id: **IOD5281059901324392598**

HTTP method and URL:

```
GET https://automl.googleapis.com/v1/projects/project-id/locations/us-central1/ope
```

To send your request, choose one of these options:

CURL	POWERSHELL

Note: Ensure you have set the GOOGLE_APPLICATION_CREDENTIALS
(https://cloud.google.com/docs/authentication/production) environment variable to your service
account private key file path.

Execute the following command:

```
curl -X GET \
-H "Authorization: Bearer "$(gcloud auth application-default print-access-token)
https://automl.googleapis.com/v1/projects/project-id/locations/us-central1/opera
```

You should see output similar to the following for a completed **import operation**:

```
{
  "name": "projects/project-id/locations/us-central1/operations/operation-id",
  "metadata": {
    "@type": "type.googleapis.com/google.cloud.automl.v1.OperationMetadata",
    "createTime": "2018-10-29T15:56:29.176485Z",
    "updateTime": "2018-10-29T16:10:41.326614Z",
    "importDataDetails": {}
  },
  "done": true,
  "response": {
    "@type": "type.googleapis.com/google.protobuf.Empty"
  }
}
```

You should see output similar to the following for a completed **create model operation**:

```
{
  "name": "projects/project-id/locations/us-central1/operations/operation-id",
  "metadata": {
    "@type": "type.googleapis.com/google.cloud.automl.v1.OperationMetadata",
    "createTime": "2019-07-22T18:35:06.881193Z",
    "updateTime": "2019-07-22T19:58:44.972235Z",
    "createModelDetails": {}
  },
  "done": true,
  "response": {
    "@type": "type.googleapis.com/google.cloud.automl.v1.Model",
    "name": "projects/project-id/locations/us-central1/models/model-id"
  }
}
```