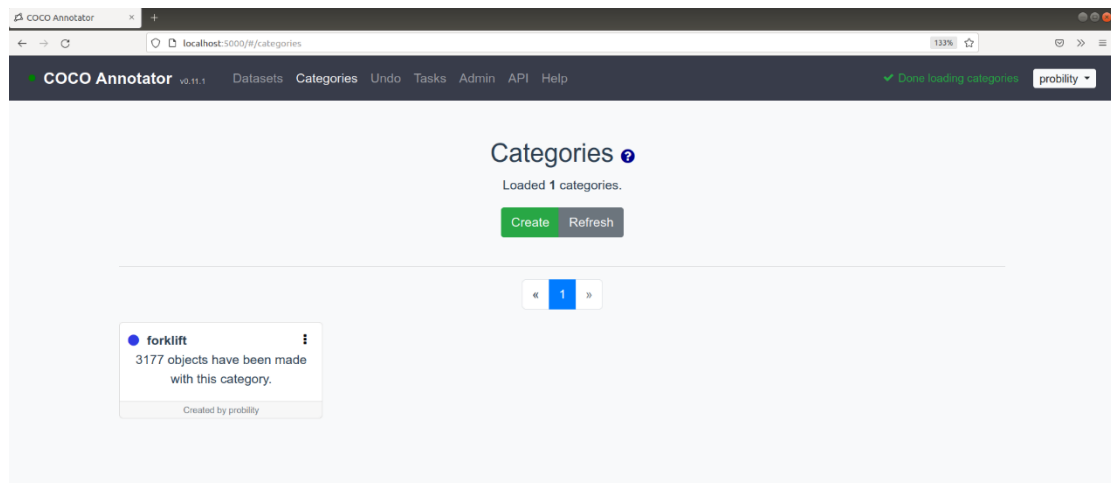


Initial the Settings

1 Create Datasets and categories

Before creating the Dataset, you need to create a category. For us the category should be called **“forklift”**.

Click the button **“Categories”** on the website and click the green button **“Create”** when you enter the **“Categories”** section.



Fill **“forklift”** in the **“Name”** and **“Supercategory”**. The Color don’t need to be set. It doesn’t come to the end of creating a category. Labels should be added.

Creating a Category

Name:

Name

Supercategory:

Supercategory

Color:

Keypoints

Label:

Connects to:

No keypoints.

Create Category

Close

Labels for the forklift annotation

There are **12** predestinated **keypoints** of forklift in our design, which are 4 points for roof, 4 for the wheels and the other 4 for the fork. They are:

[0]	<i>top_front_left</i>	[0, 1], [0, 2], [0, 4]
[1]	<i>top_front_right</i>	[1, 3], [1, 5]
[2]	<i>top_back_left</i>	[2, 3], [2, 6]
[3]	<i>top_back_right</i>	[3, 7]
[4]	<i>bot_front_left</i>	[4, 5], [4, 6], [4, 10]
[5]	<i>bot_front_right</i>	[5, 7], [5, 11]
[6]	<i>bot_back_left</i>	[6, 7]
[7]	<i>bot_back_right</i>	
[8]	<i>fork_front_left</i>	[8, 10]
[9]	<i>fork_front_right</i>	[9, 11]
[10]	<i>fork_back_left</i>	
[11]	<i>fork_back_right</i>	

Besides, the relations or the connections between these keypoints should also be added.

The process to create our category will be shown as followings:

1. Give all 12 labels their right name
2. Choose the right connections for each label
3. Check whether your settings are the same as our goal in the pictures below
4. Click the green button “**Update**” to create a category.

Tipps: If you, for example, choose *top_back_right* as one connection of *top_front_left*, then in the connection part of *top_back_right*, *top_front_left* will be automatically filled.

Creating a Category



Name:

forklift

Supercategory:

forklift

Color:

Keypoints



Label:

Connects to:

top_front_left



Label



Add connected label

Label



Add connected label

Label



Add connected label

Label



Add connected label

Keypoints



Label:

Connects to:

top_front_left



- top_back_left ✕
- top_front_right ✕
- bot_front_left ✕

Add connected label

top_front_right



- top_front_left ✕
- top_back_right ✕
- bot_front_right ✕

Add connected label

top_back_left



- top_front_left ✕
- top_back_right ✕
- bot_back_left ✕

Add connected label

top_back_right



- top_front_right ✕
- top_back_left ✕
- bot_back_right ✕

Add connected label

bot_front_left



- top_front_left ✕
- bot_front_right ✕
- bot_back_left ✕
- fork_back_left ✕







Add connected label

bot_front_right



- top_front_right ✕
- bot_front_left ✕
- bot_back_right ✕
- fork_back_right ✕

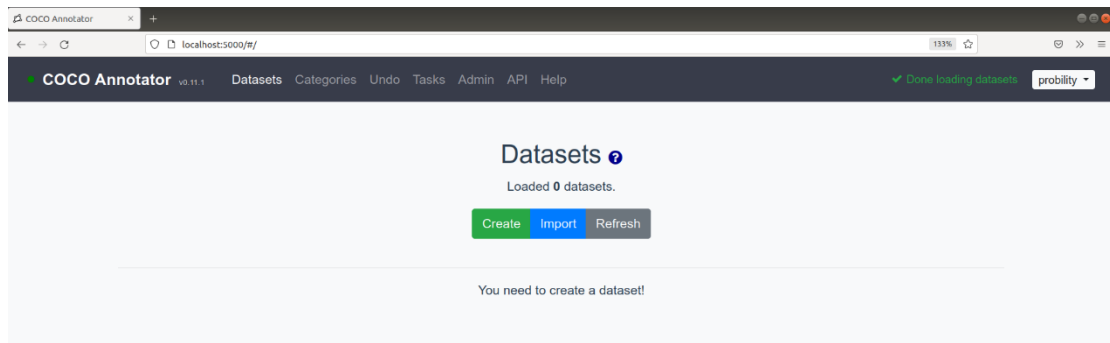
Add connected label

		<div>Add connected label</div>
bot_back_left		<div>top_back_left ✕ bot_front_left ✕ bot_back_right ✕ Add connected label</div>
bot_back_right		<div>top_back_right ✕ bot_front_right ✕ bot_back_left ✕ Add connected label</div>
fork_front_left		<div>fork_back_left ✕ Add connected label</div>
fork_front_right		<div>fork_back_right ✕ Add connected label</div>
fork_back_left		<div>bot_front_left ✕ fork_front_left ✕ Add connected label</div>
fork_back_right		<div>bot_front_right ✕ fork_front_right ✕ Add connected label</div>

Update

Close

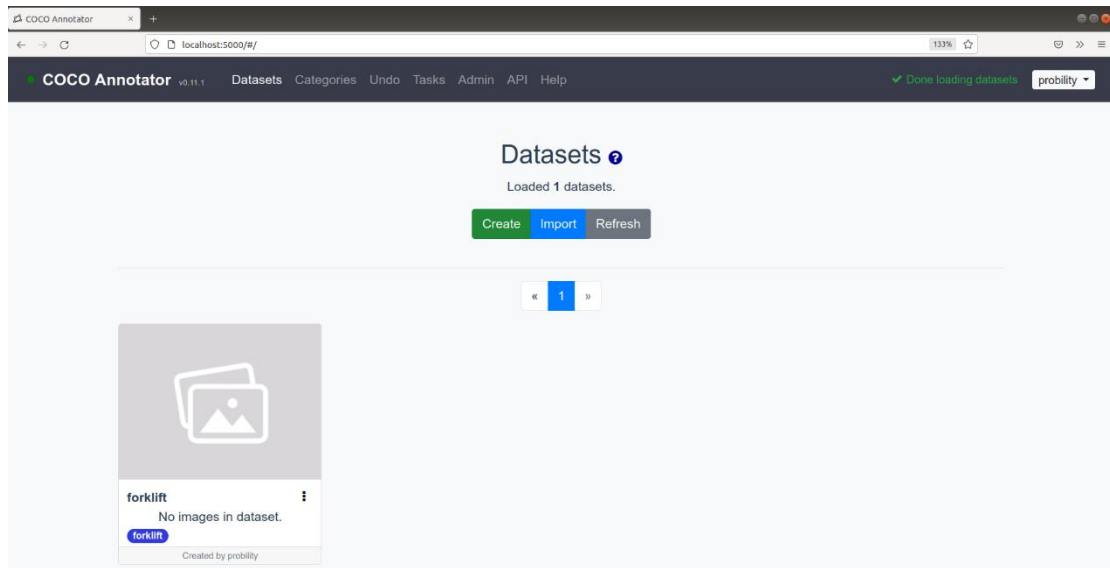
Now we are going to create our dataset in COCO-Annotator. Go back to the homepage and click “**Datasets**”.



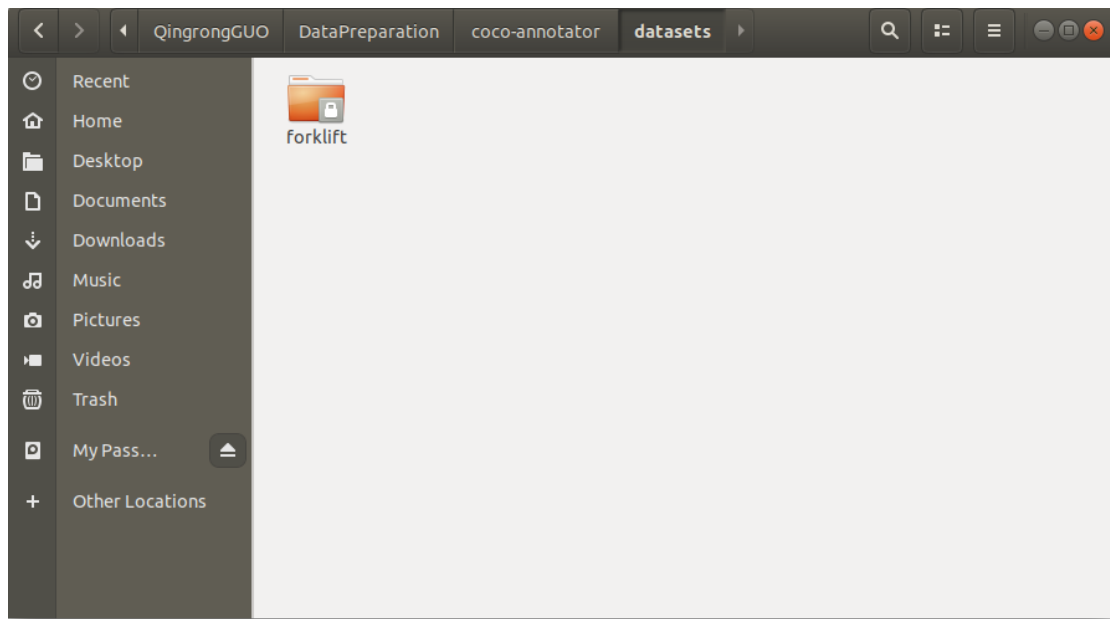
Click the green „Create” Button, give a name of the dataset, choose the categories you set and confirm.

A modal dialog titled 'Creating a Dataset' with a close button (X) in the top right corner. It contains three input fields: 'Dataset Name' with the value 'forklift', 'Default Categories' with a tag 'forklift' and a text input 'Add a category', and 'Folder Directory' with the value '/datasets/forklift/'. At the bottom are two buttons: 'Create Dataset' (blue) and 'Close' (grey).

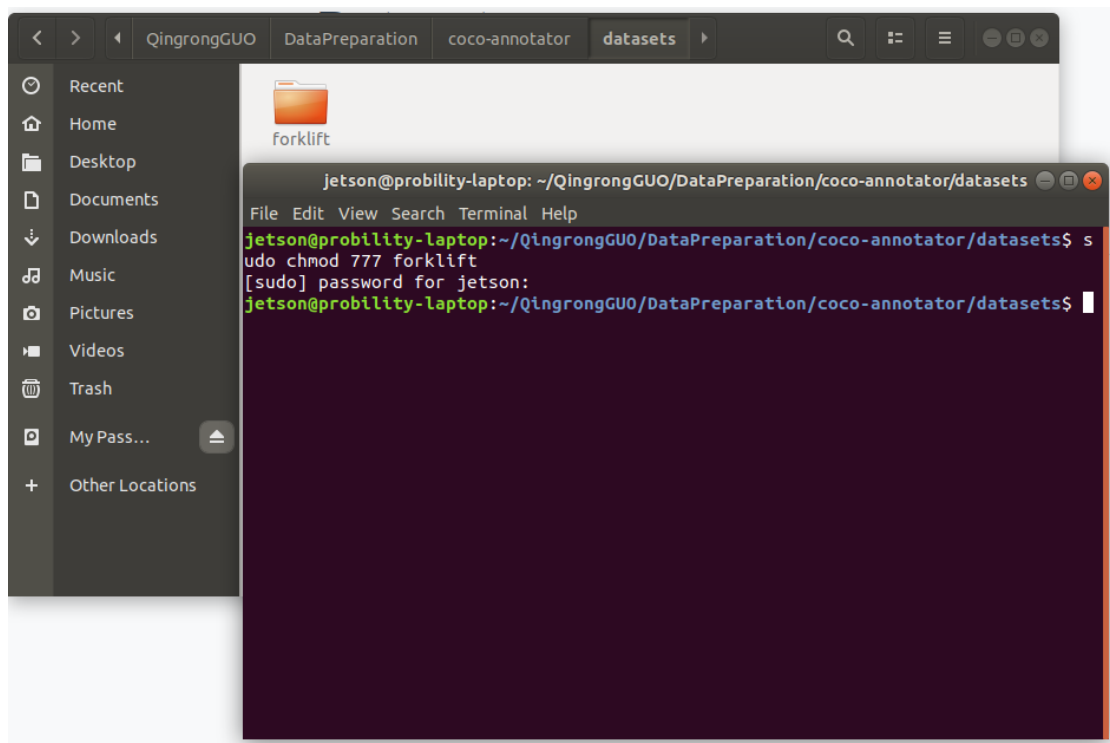
After the confirmation a new dataset is created shown as followings. New images should be added into the dataset, actually into the local folder.



The locked folder:

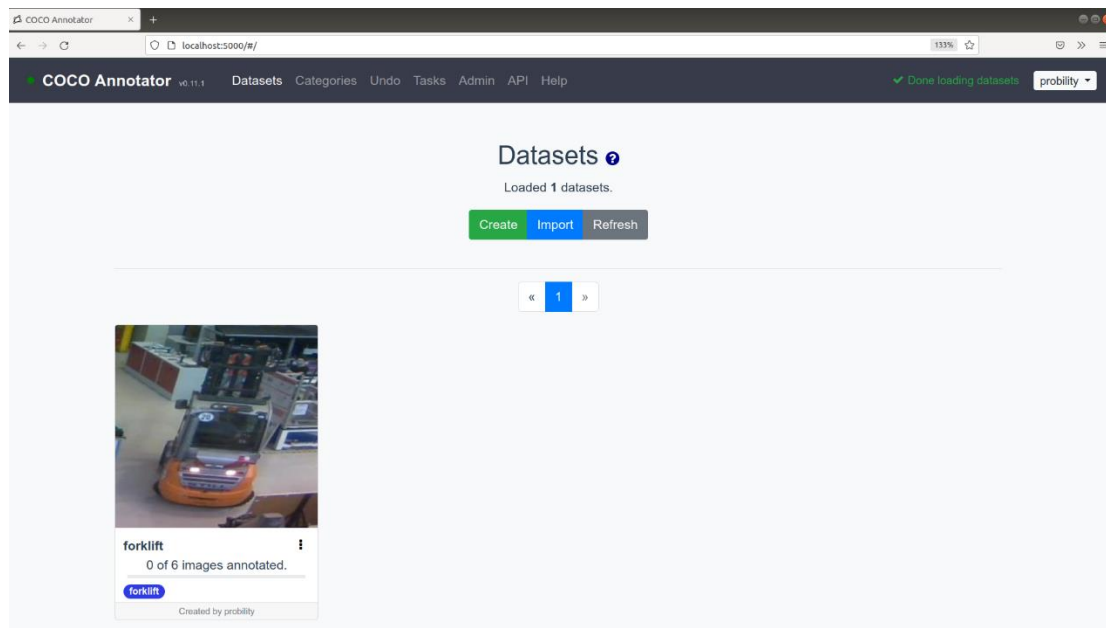


Unlock the local folder:



Move (copy) all your images into this local folder and go back to the page of COCO-Annotator in the browser.

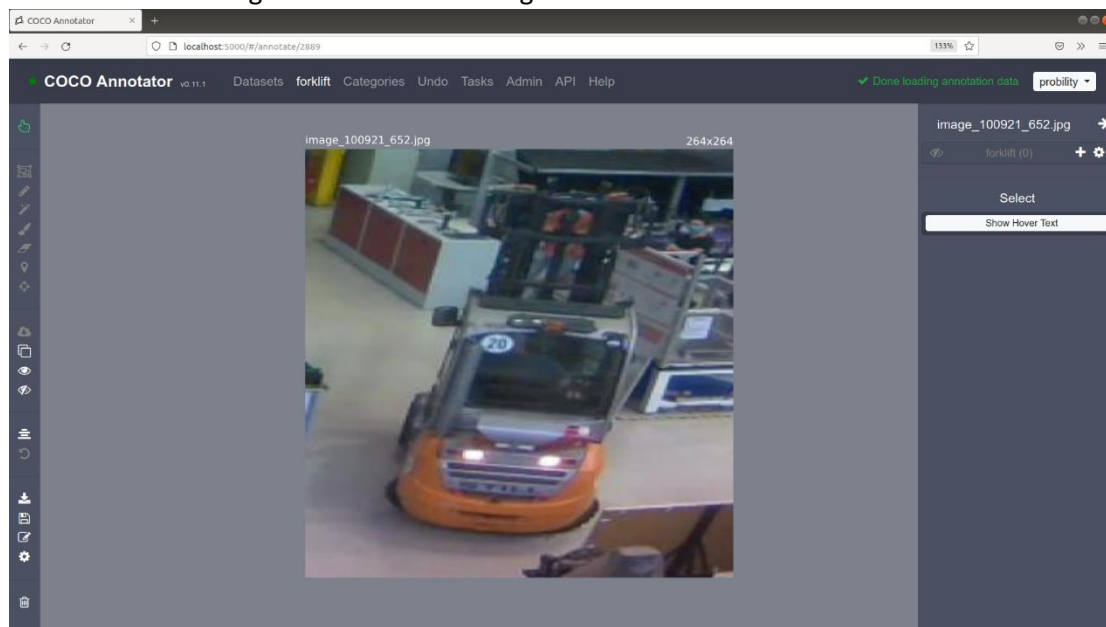
Click the gray button “Refresh” to refresh the changes (get the images)



Click the „forklift” Dataset and you will see all the images in this dataset.

2 Annotate the images

Choose the first image in the Dataset to begin the annotation work.



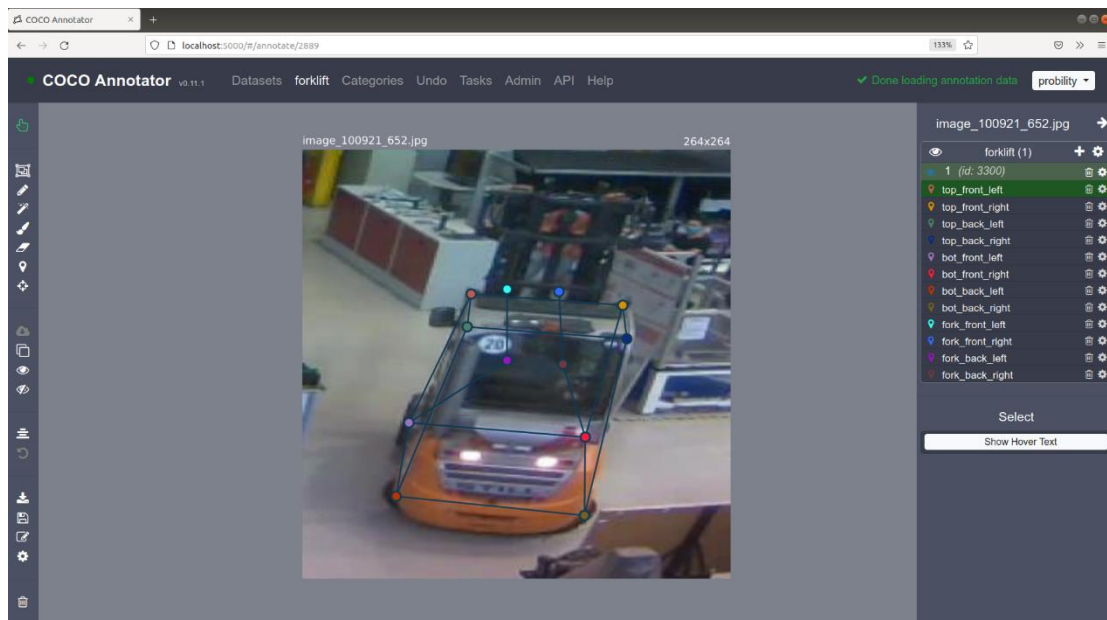
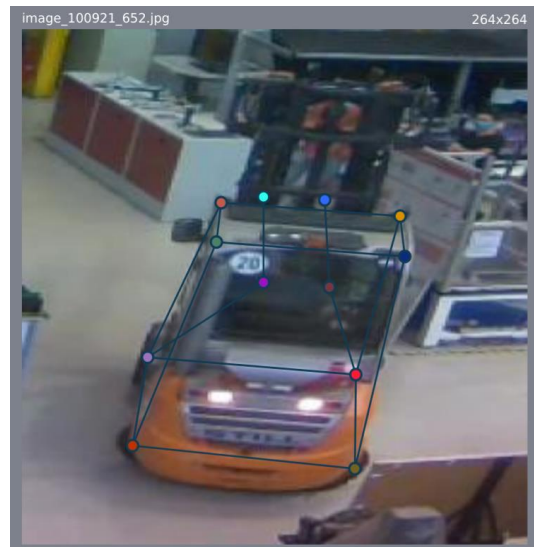
Click the **plus icon +** on the right side to add one object to be annotated. Then choose the **Keypoints Tool** on the left side (its icon looks like a **location icon** on the map) or press **“K”** on the keyboard to use Keypoints Tool. Afterwards you can place the keypoints for the objects in the image.

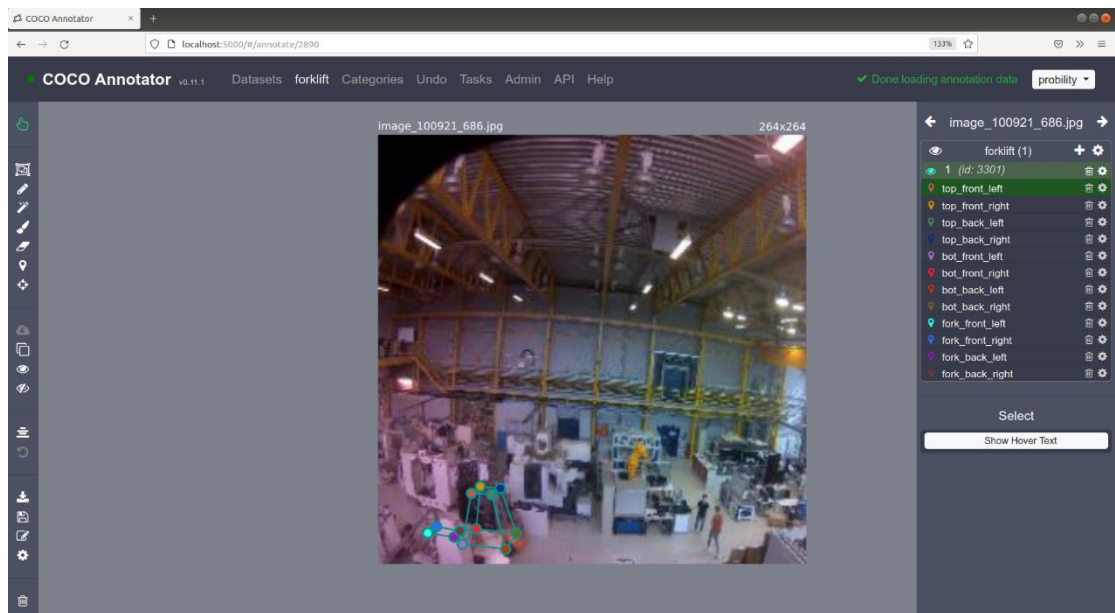
Tipps: The images can be zoomed up.

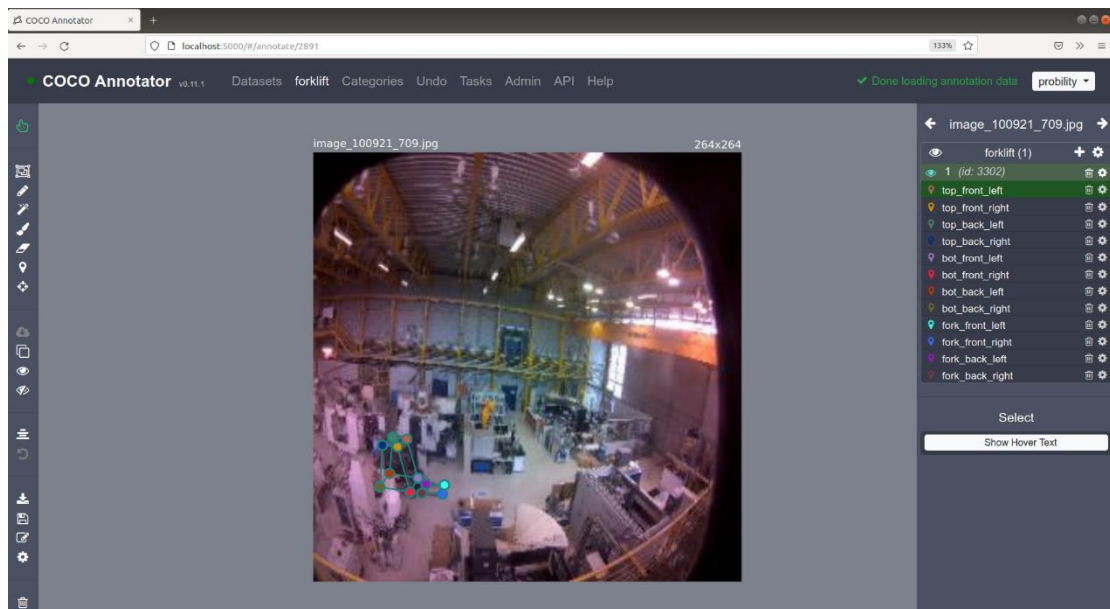
Three Rules for annotation work:

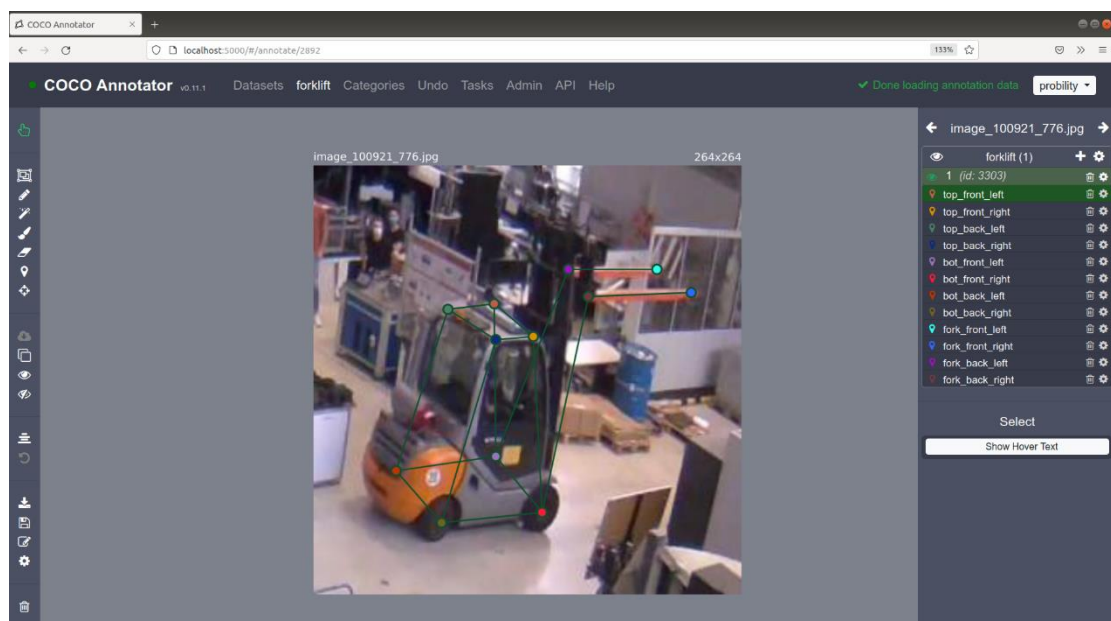
1. **Mark the keypoints in the correct place and order.** Theoretically it needs 12 clicks to finish the annotation work for one single image if there is only one forklift in the image. A keypoint will be created and placed on the position where you click the mouse. If it works smoothly and well, the first click creates *top_front_left*, the second *top_front_right*, the third *top_back_left* and the last *fork_back_right*. Besides, for example the keypoint *top_front_left* should be placed on the front left of the forklift roof. If a keypoint is marked on the wrong place, click the trash bin button to delete the marked keypoint and then mark the keypoint again (Attention: After deleting a keypoint, the automatical order might change, please be careful).
2. **The keypoints and the lines (connections) should form a geometric shape like forklift.** The top and bottom 4 points should separately create two approximate parallelograms, which means that the lines [0, 1] and [2, 3], [0, 2] and [1, 3], [4, 5] and [6, 7], [4, 6] and [5, 7] should be parallel and have a similar length. It also works for the keypoints of the 2 forks.
3. **Mark all the keypoints in the images.** If the keypoints are in the images, mark them no matter whether the points are seen or not (obscured by obstacles). If some points can't be seen directly, you should estimate their positions and mark them there. So basically there will be 12 keypoints for one object in the image. Only when one or more keypoints are outside the image, they are not to be marked, which means that the annotated points can be less than 12 points.

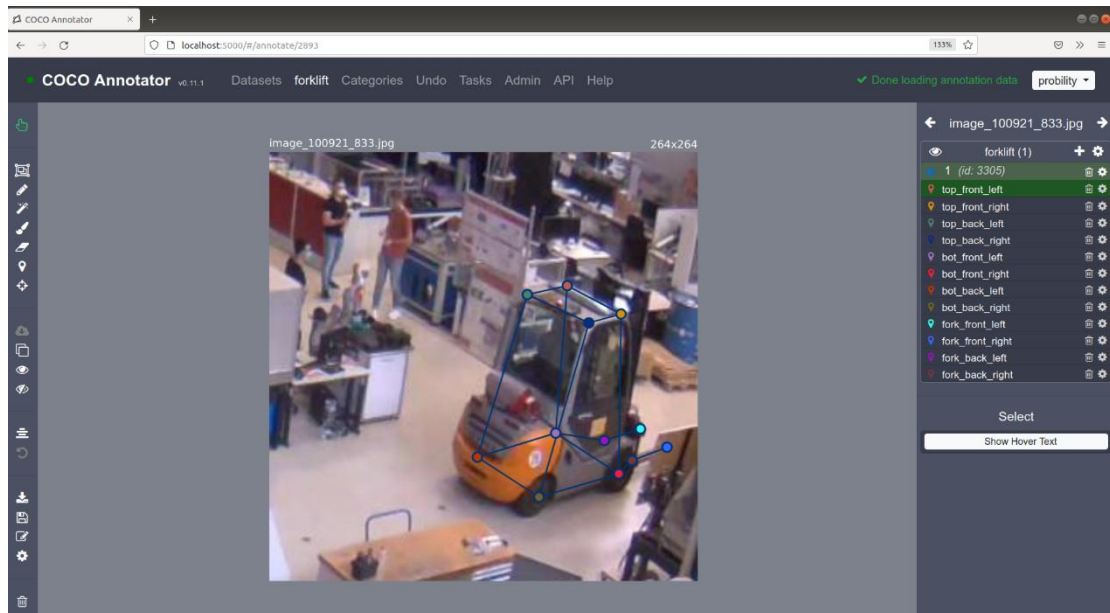
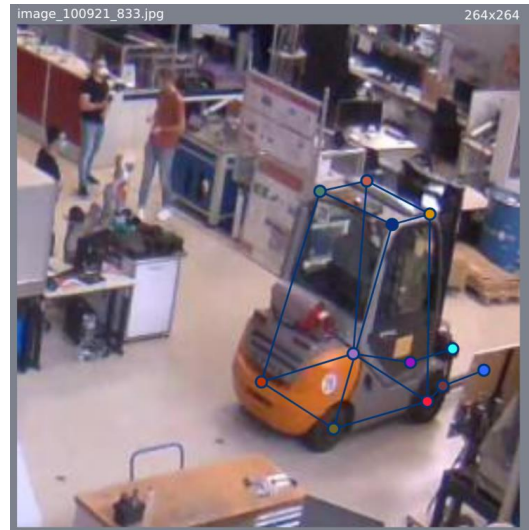
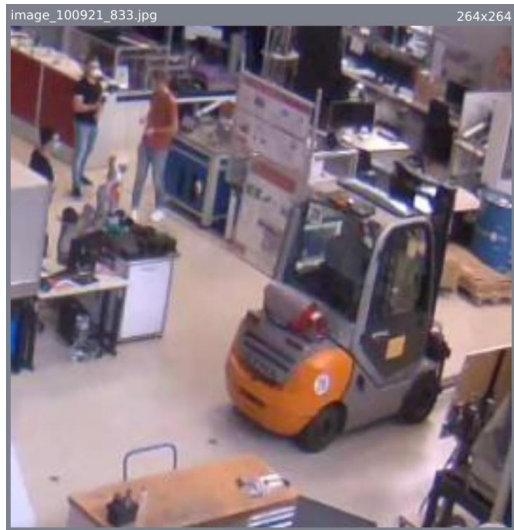
There are some examples:

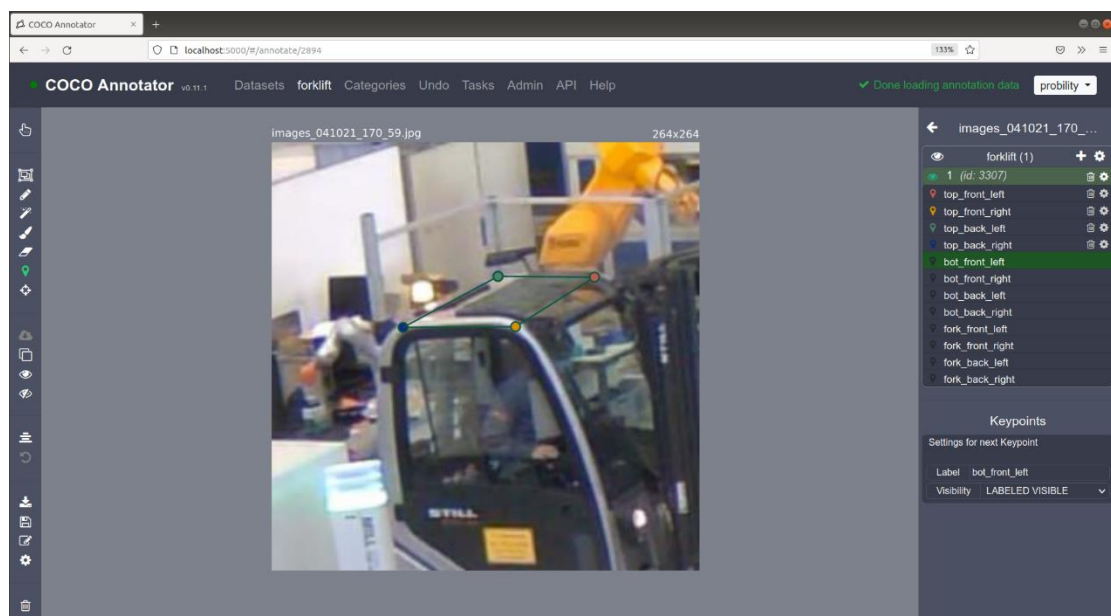
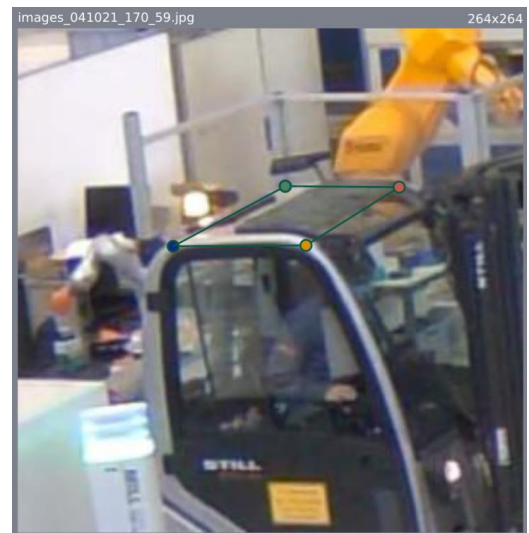
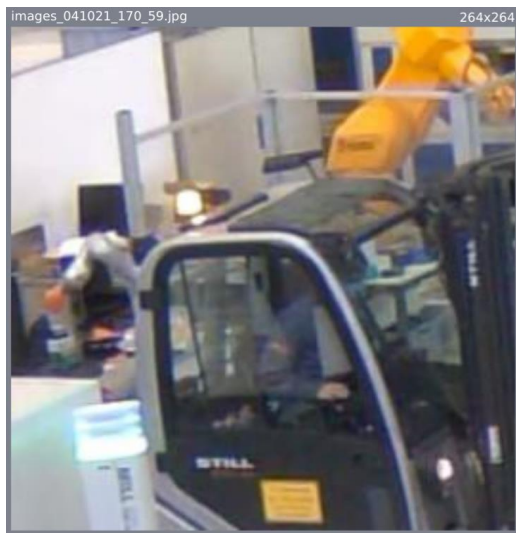




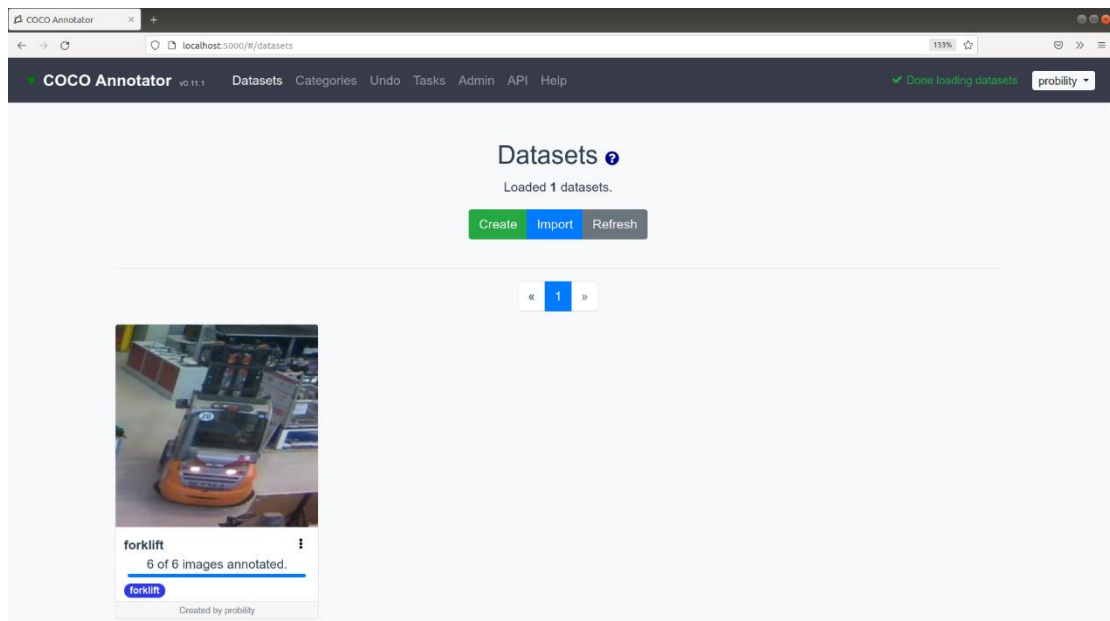








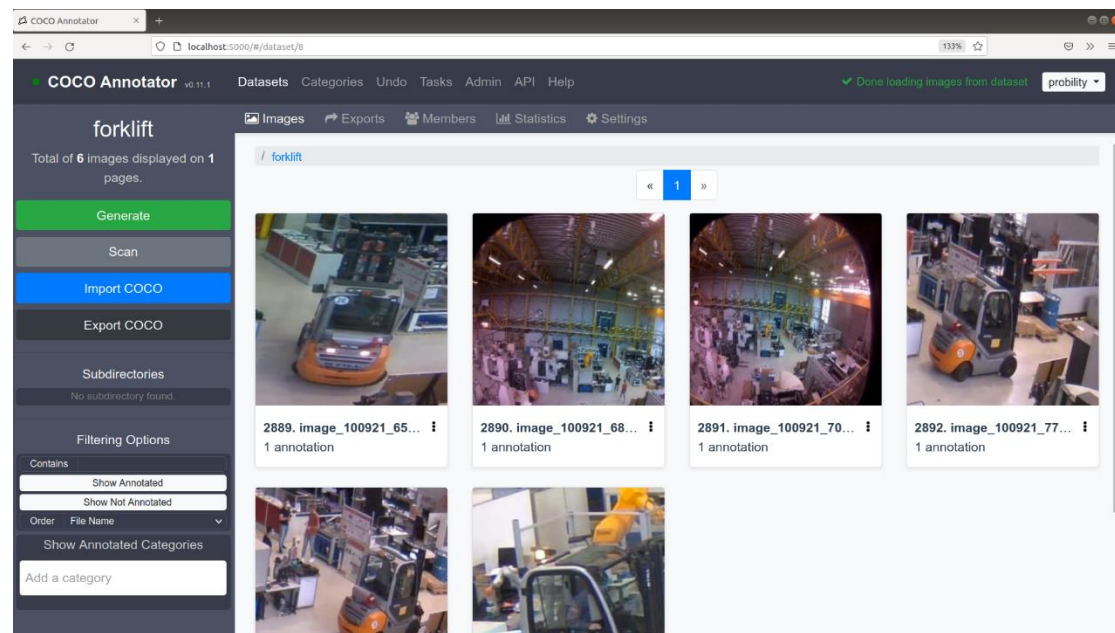
After the annotation work is done completely, go back to the homepage, choose “**Datasets**” and you will have a overlook of your datasets and know how many images are annotated.



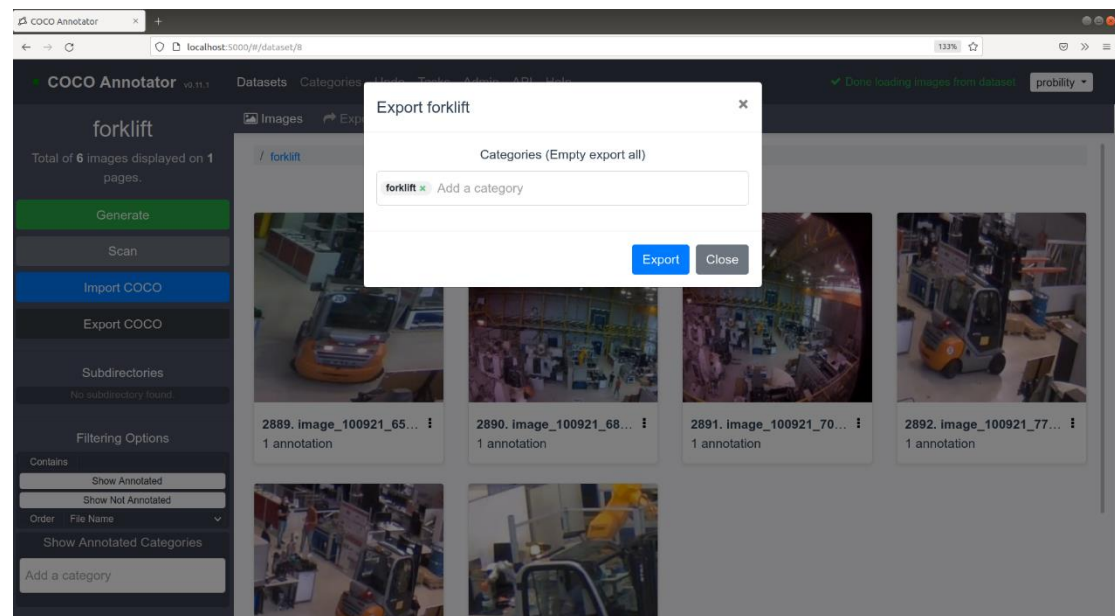
Click the dataset “**forklift**”, you will see all the images and check whether some exact images are still not annotate. If there is no annotation in an image, the information shown below the name of the image will be “**no annotation**”. If there are 1 or more annotations, it will be “**1 annotation**” or “**2, 3, 4... annotations**”.

3 Export the dataset

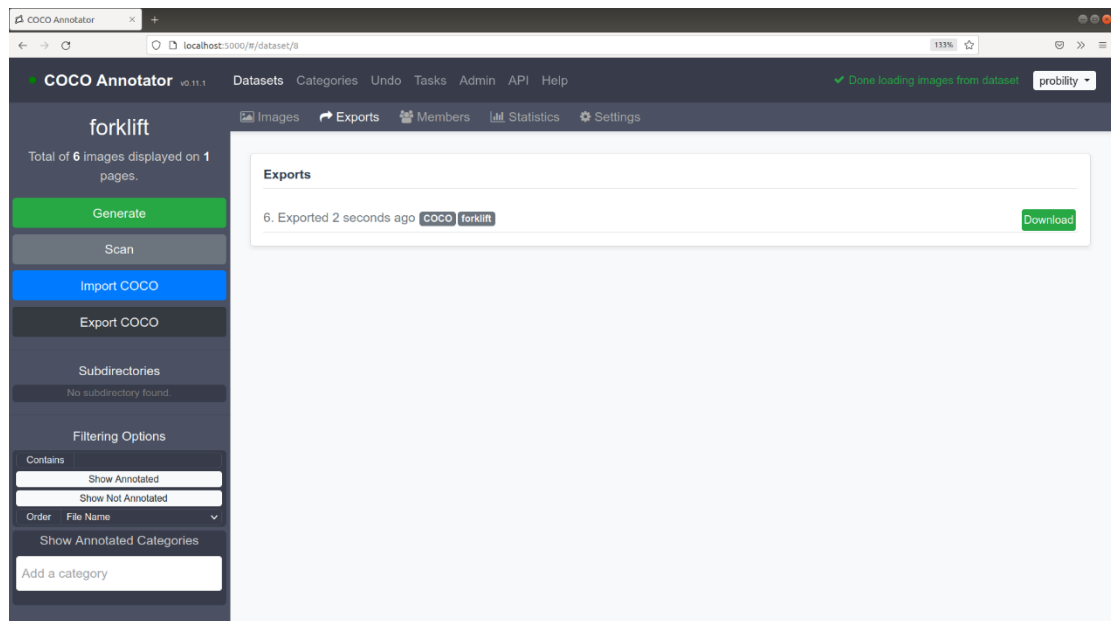
Click the black button “Export COCO”



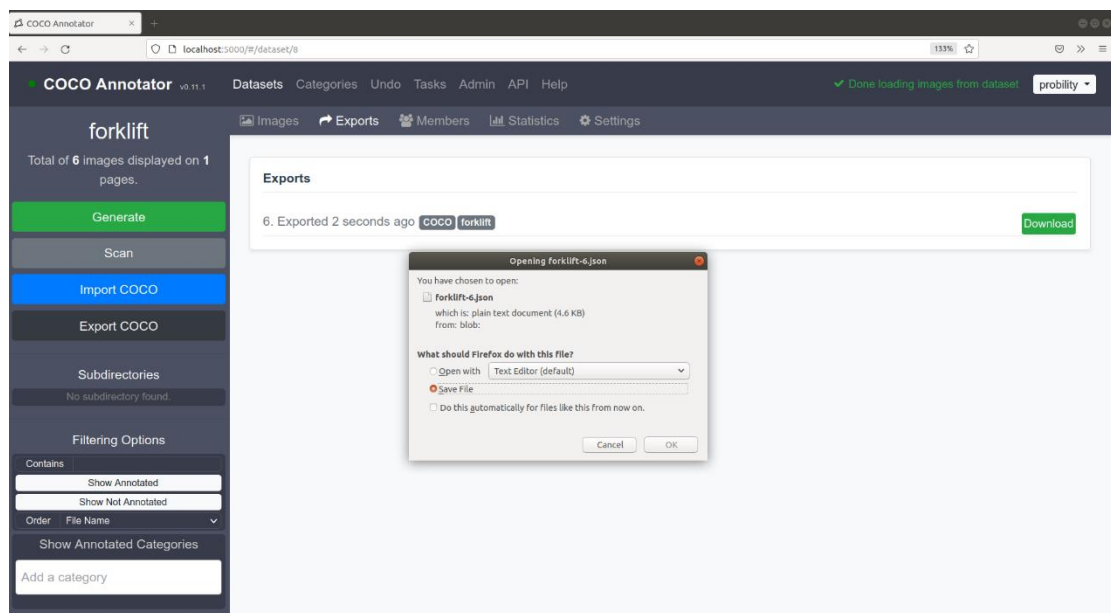
Choose the category “forklift” and click “Export”



Click “Exports” next the “images” and click the green button “Download”.



Save the json file.



Find the path of the json file and rename it to, for example, forklift_qingrong_1012.json

