

Protocol for annotating thermal images using Roboflow app

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Check the Roboflow project here:

<https://app.roboflow.com/myprojects-jom25/trees-xzuvl/overview>


Image upload and tag attribution

- 1) Upload images from a given sample (i.e., a folder containing a set of images), for instance: MAPLE1 > MAPLE1_Sample1;

 Sharing Page

 Upload


- 2) Drag and drop the folder with the images to annotate in Roboflow;
- 3) Before going into the next stage, add a Tag to the data. This will allow later to search and filter data by sample ID. On the right side of the GUI, use this option:

Tags: 

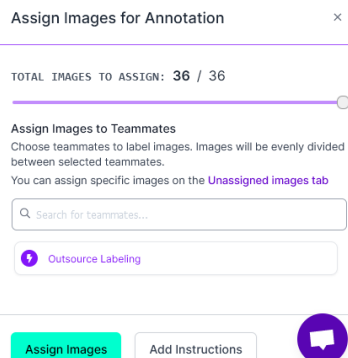
Assign the sample ID as the folder name, e.g., MAPLE1_Sample1;

- 4) To enter the tag with the sample name and index, e.g., QUEROB1_Sample1

To save the uploaded images, do: "Save and continue";

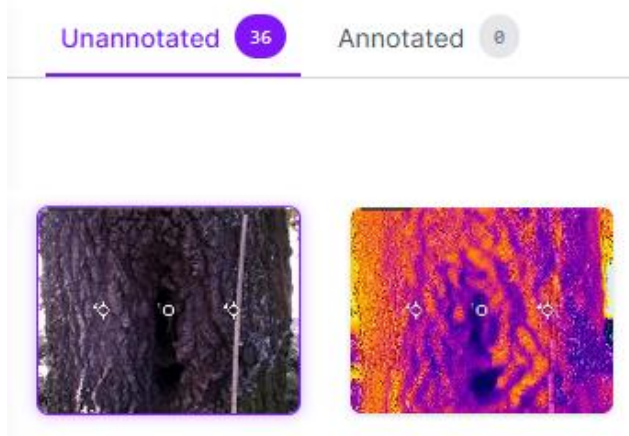
 Save and Continue

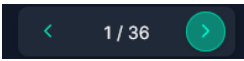
- 5) Then, assign images for annotation – this feature of Roboflow is meant for collaboration in the annotation process (although helpful, the collaboration functionality is somewhat limited in the free version of the app):



- 6) Go to “Annotate” to draw masks around tree structures and assign labels to each MH or tree structure and also for ground images.

From here, select one image and start the annotation process:

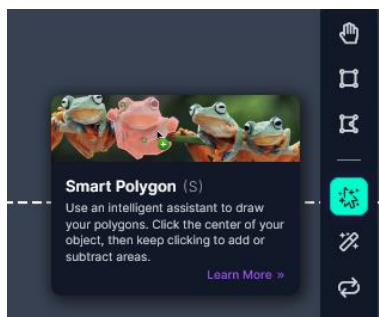


This handle on the top:  can be used to move around unannotated images.

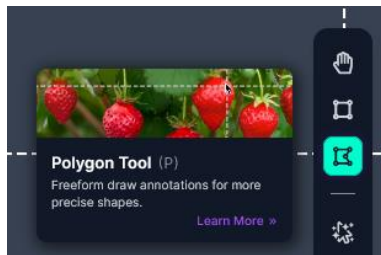
Mask and annotation creation process

The right-side toolbar allows selecting the most adequate tool used for annotation.

Use either “**Smart Polygon**” – This is a semi-automatic tool based on SAM deep learning and segmentation model and can retrieve object boundaries easily, sometimes with a single click. Use one click to add one point inside the area you want to be on the polygon mask. If new points are added within the initial area, that area will be removed. Conversely, if a point is placed outside the existing area, the algorithm will try to expand the object the best way possible by context, spectral and textural similarity.

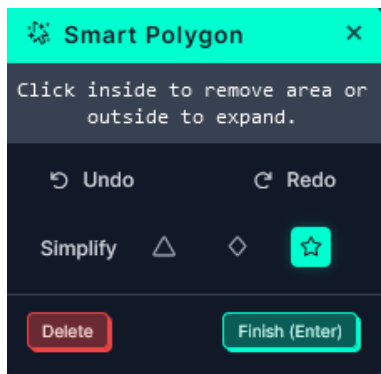



Another available option is the fully manual “**Polygon Tool**”, which gives complete control to the user for drawing a polygon to delineate the mask.

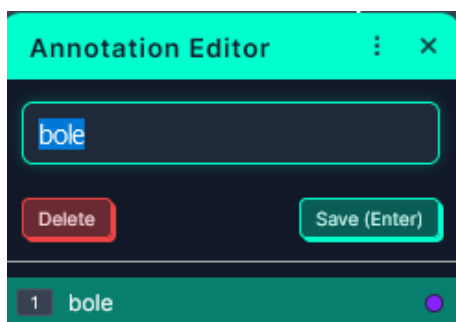


i Note: polygons cannot have “holes” or “islands”. This set of tools for annotation in Roboflow app cannot handle such representations.

- 1) Add points where you want to find a coherent area to start delineating the mask. Green points are added to the mask area. Reds are removed from the mask. Allow for complex shapes (the star option on the right):



- 2) Do Finish  and set the proper class by writing or selecting it (if it already exists; Note: label names should always have precisely the same writing):



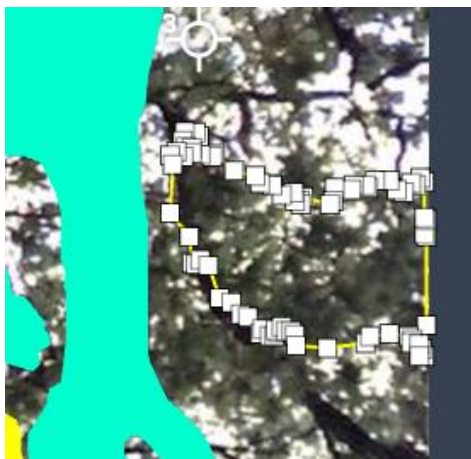
One example of a bole. Because we want to separate the central cavity in the image, this will take one extra step and mask, i.e., one for the bole and another one for the cavity itself. The final result with three masks (2 for the bole, centre and right-side, and one for the central cavity):



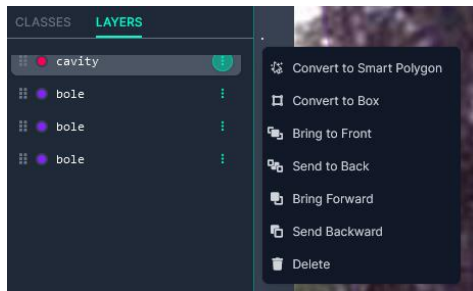
i Info: Use Control + Z or  to get back on step

Press the “Esc” button to exit the mask/polygon interface.

i Note: Before closing the new mask/polygon, it is possible to edit the vertices individually. Drag them to the correct position if required. You can also eliminate them by pressing on top of the vertex icon.

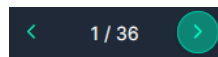


i Info: Post-edition is also possible by going to Layers and pressing the “three-dot” icon on each layer – no option is needed to edit the polygon mask directly:

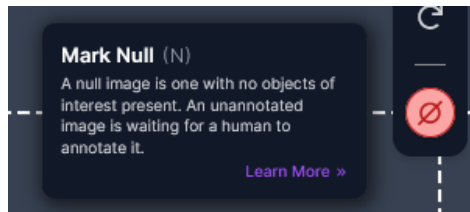


3) Once finished, do “Save (or Enter)”

4) Move to next image in the right arrow:



If the new image is repeated from the previous one (keeping in mind there are both RGB and hybrid RGB / TIR images in the folders), you can skip it by pressing the “Mark Null” option in the right-side toolbar:



i Note: sometimes it is easier to create masks with RGB and other times with thermal. It depends on image quality and the ability to extract boundaries from the images, which sometimes are fuzzy.

5) Once finished, exit the Annotation mode.

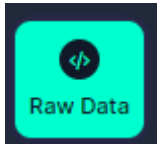
Saving the annotations to JSON file

- 1) Go to Annotation mode: Annotate > Annotated >

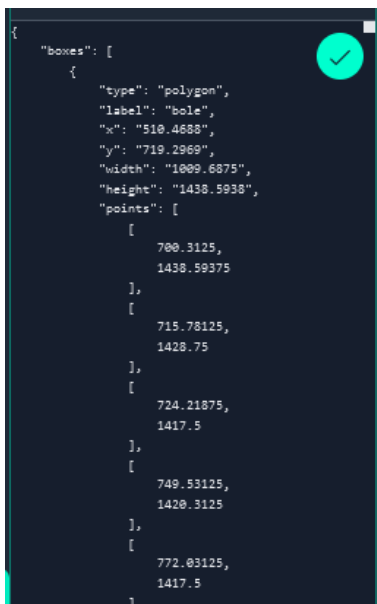
Unannotated 35 Annotated 1

(sometimes, you may need to exit and re-enter the annotation mode to have access to the final masks in polygon format);

- 2) In Annotation mode Go to “Raw Data”



- 3) Copy the annotation polygons/masks by pressing the top right button – if it is copied, a checkmark will appear:



- 4) Open Notepad++;
- 5) Create a new file and then paste the json data from Roboflow onto Notepad++;
- 6) Save the file with exactly the same name as the image file but with a json extension (in lowercase). The name of the image file is at the end of the json file here:

```
2382         ],
2383         [
2384             495,
2385             1025.15625
2386         ],
2387         [
2388             506.25,
2389             1053.28125
2390         ],
2391         [
2392             511.875,
2393             1089.84375
2394         ],
2395         [
2396             527.34375,
2397             1096.875
2398         ]
2399     ]
2400 }
2401 ],
2402 "height": 1440,
2403 "key": "EINBRGB_BWWG4662.JPG",
2404 "width": 1080
2405 }
```

EINBRGB_BWWG4662.json

Normal text file (*.txt)

Normal text file | length : 60 058 | lines : 2 405 | Ln : 2 403 | Col : 2

7) Save the file in the exact same location as the images;

8) After taking the json data, add the images to the training dataset to move to the following sample.

Add 36 images to Dataset

Add Images To Dataset

Add 36 images to dataset

[What's Train, Valid, Test?](#)

Method

Add All Images to Training Set

Image Distribution

Train: 36 images

Valid: 0 images

Test: 0 images

You are about to add 36 images to the dataset

0 images will be sent back as part of a new job

Add Images