

RECONN.AI USER GUIDE

1. ACCESS AND LOG-ON

Access to RECONN app can be achieved through front-facing website (<https://reconn.ai>)

A. Setting up New Account

- i. To set up an account and log-on for the first time, click on “sign in” in the upper right corner.
- ii. Separate log-on page will display, click on “sign-up”
- iii. You will be prompted to review and confirm your understanding of our Terms of Service and Privacy Policy.
- iv. Log-in can be tied to any e-mail account you choose and password access (must contain 1 character)

B. Initial Navigation

- i. Once logged in, you’ll be back on the website with multiple header links
- ii. Create a user profile
- iii. Search bar (see Chapter 5)
- iv. Diagnostics page provides a transparent view of current species dataset, image counts, and predictive performance metrics for the algorithm
- v. Dashboard is your home page, where all photos, storage, annotation and export occur

2. DATA AND FILE STRUCTURE

RECONN app is set up into 3 buckets/tiers, (Organizations, Projects, Collections)

A. This tiered layout and structure provides a lot of customization options in terms of how the specific user wants to allocate and store their images and data.

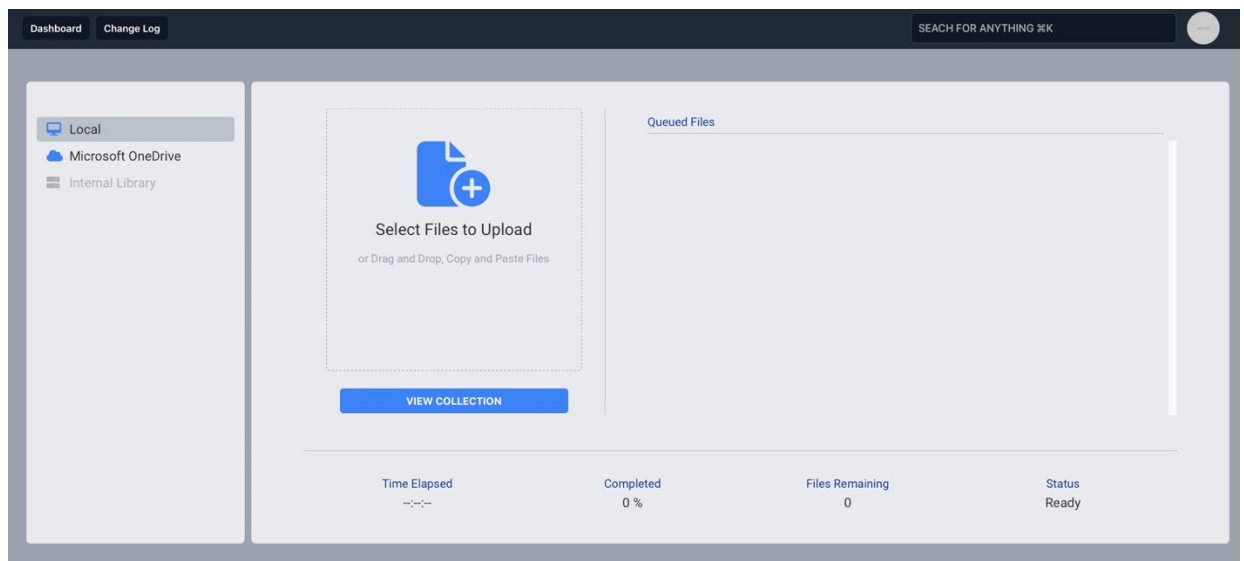
- i. The idea behind Organizations is to induce sharing of a certain project amongst multiple users. You can link multiple user accounts to the same Organization for collaboration.
- ii. Projects could be just that, a standardized tier to encompass all images for a certain research study or project in use. A project can also be shared across different user accounts.

- iii. Collections could be organized based on a specific camera the images originated from, timing of image collection, or anything else. To add a collection, you must first enter a given Project.
- B. Once any of these tiers are created to support a certain application, all can be deleted if need be with the trashcan icon. There is a secondary prompt once you hit the trash can icon for the deletion of both Projects and Collections to ensure no accidental deletions.
- C. Once created, you can re-name a specific Collection at anytime by simply clicking on the name. You do not currently have the ability to re-name Projects.
- D. To add a Collection within a designated Project, first click on the Project, then click on “New Collection”
 - i. When you create a new Collection, a pop-up screen will display, allowing you to name it, and provide a summary if applicable for the photos contained therein. As mentioned previously, a Collection can be re-named by clicking on the name.

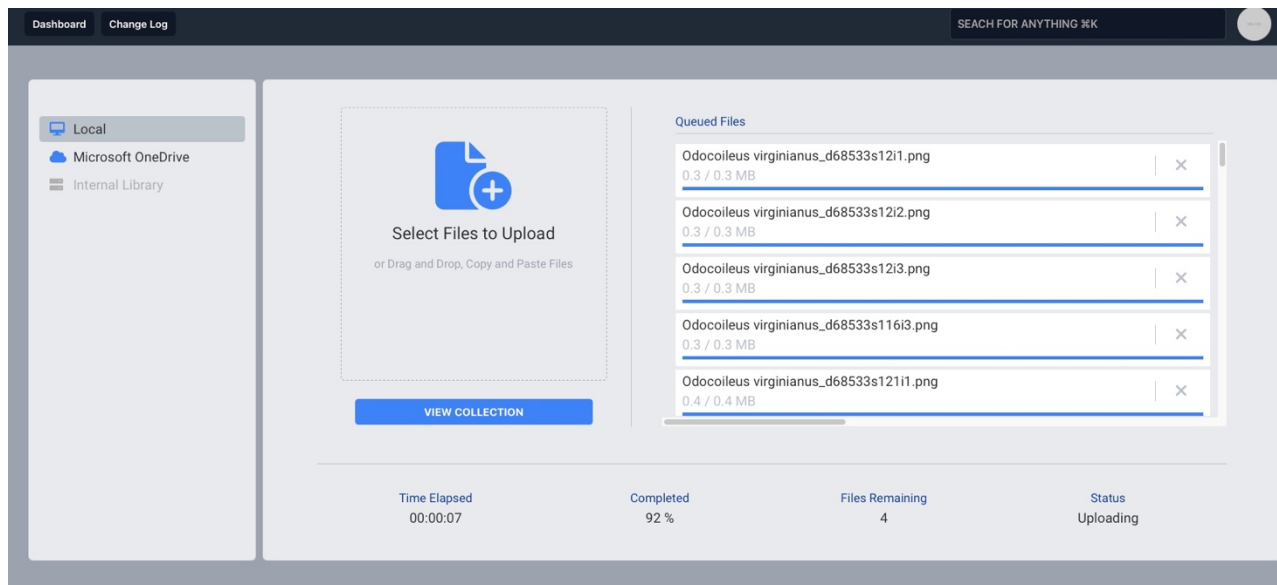
3. UPLOADING PHOTOS

When uploading camera trap images to a Collection on the site you have two options for sourcing; locally from your computer, or Microsoft One Drive

- A. Uploading can be conducted in two ways, the first is by clicking on the blue upload icon on the Collection/Project home page in the upper right corner.
- B. You can also click on the individual collection to enter the Collection Annotation page, then click on “Upload Images” in the upper right corner.
- C. The photo upload page looks like this, with the previously stated option to source either locally or through One Drive:



- i. If sourcing locally, select the individual files, or drag and drop, copy and paste.
 - ii. If using Microsoft One Drive, select the individual folder containing the images for upload
- D. Once you have selected the photos for upload and begin the process, you will see the individual files/photos appear on the right side under “Queued Files.” You will also have a real-time running status of your upload progress with a timer (Time Elapsed), percent completed (Completed), and number of files/photos still in the queue for upload (Files Remaining).



- E. Once upload has been complete, click on “View Collection” to be taken to the main Collection home page for annotation and predictions.

4. REVIEWING, TAGGING, AND ANNOTATING PHOTOS

Once uploading of images into a Collection is complete, you’ll be taken to the Collection Annotation page. The images you have uploaded will appear along the left in sequential order, with the image currently selected taking up the rest of the screen. You will know what image is in the main display due to the blue border that appears around the highlighted image on the left. Images, after being uploaded and run through the RECONN algorithm, will contain either a green bounding box (signifying the algorithm made a prediction), or they will still appear blank, with no bounding box present.

- A. If the algorithm has not made a prediction on a certain image, it will appear blank. If you have made a positive identification on the animal within the image, you can draw a bounding box manually through a simple process:

- i. First, select your species from the gray drop down box in upper left. The red box next to it also prompts you to select your species before manual annotation occurs. Once you've found the correct name in the drop down, click on it.
 - ii. When you click on the gray Species Selection Box, any species that has been identified within that collection by the algorithm will appear automatically. In addition, any animal that you select before manual annotation will also appear in the future in the dropdown menu for ease of use.
 - iii. Once you have selected the species, your cursor overlaid on the image will now allow you to draw a bounding box around the animal. Bounding boxes do not have to be exact, try and capture as much of the animal as you can, even if that involves capturing some of the background. If there are multiple animals within the same image, you can draw multiple bounding boxes, with each getting their own. Once the bounding box has been drawn by the user with labeled species in will appear green with a green check mark in the upper right corner. This check mark identifies a CONFIRMED ANNOTATION
- B. If the algorithm has made a prediction on an uploaded image the green bounding box will already have been drawn with the predicted species name next to it**
- i. The algorithm will hopefully predict the animal correctly, with common name appearing next to the bounding box. If you agree with the algorithm's prediction, you can either click on "confirm annotation" under the species name, or hit the letter "C" on your keyboard. Shortcut keys for ease and speed of navigation amongst images have been implemented (See Section D)
 - ii. If the algorithm has made an incorrect prediction regarding a certain animal, or if the bounding box that it drew does not cover the animal, you can click on "delete annotation" or hit the letter "D" on your keyboard.
 - iii. Once the bounding box has been deleted, you would follow the same steps for when no initial prediction has been made, as outlined earlier. Click on the gray bar, select your confirmed species name, and draw your own bounding box around the animal.
- C. Tagging of Photos**
- i. During the annotation process, you will have the ability to "tag" an image, or Collection of images, with any label you would like. This tagging serves as a method for an easy sort amongst images when recalling or using the search feature in the future. Some examples of relevant tags: (fawn, family, night, feeding, presentation image, etc.)
 - ii. To place a tag on an **individual** photo, click on the Tag icon within the image on the annotation screen or hit the letter "T" to pull up the tagging box.
 - iii. Simply type in whatever tag you would like to be applied to the image and hit add. There is no limit to the number of tags you can add to a given picture. Once a tag is added to a selected image, it will appear on the annotation screen on the

top of the image in gray. If a species has been identified within the image, the species name will also appear as a tag in green.

- iv. You also can add a more generic tag across the entire Collection, instead of on an image-by-image basis. This Collection wide tag will tag every image in the Collection with the same tag, without the need for you to go through individually tagging all images with the same info. To tag all images within the Collection, click on the “more” button of a specific Collection while on the Project screen. The more button is located in the bottom right corner of a Collection. Clicking on “more” will also give you a list of all current tags applied within the collection.

D. Shortcut Keys

- i. For ease of navigation while reviewing and annotating photos, 4 separate shortcut keys exist:
 - i. Up/Down arrows to move through images on Collection Annotation screen
 - ii. “C” key to confirm the RECONN predicted species in lieu of clicking on the sun shaped icon within the bounding box
 - iii. “B” key to confirm that an image without a drawn bounding box is blank, with no wildlife present
 - iv. “D” key to delete the highlighted image from a Collection
 - v. “T” key to open tagging box on Collection Annotation Screen

5. SEARCH BAR USE AND FUNCTIONALITY

The search functionality within RECONN is a powerful tool that can allow you to further streamline annotation and review efforts, sort by specific parameters of interest within a given collection or project, act as an additional storage tier, and help aid in targeted image review or export of data.

- A. To begin a search type your query into the Search bar in the header. You can search based on a given species, something you may have tagged, etc.
- B. A results page will appear summarizing your search results into 4 categories
 - i. Species – if you searched for a species name, this will display the total amount of images you uploaded in RECONN annotated as that animal
 - ii. Tags – the results here will be a summation of any manual tags you added
 - iii. Collections – this will break down the total number under Species into the various Collections that contain the searched for species or tag with the Collection name listed
 - iv. Projects – this will break down the total number under Species into the various Projects that contain the searched for species or tag with the Project name listed

- C. Upon clicking on any of these 4 categories, you have two options. You can either click on the blue image icon to be taken to the search results in image for on the Collections Annotation page, or select the CSV file to export the resultant data associated with the searched for images.

6. EXPORTING DATA

Ultimately, the results of your annotation work and RECONN's predictive power are what matters, and to facilitate the gathering and summation of that work, you have the ability to export a generalized CSV file containing the image resultant data on any subset of image data you are interested in. The export data feature can be accessed from a variety of places.

- A. The most common location is the "Export Data" blue box located on the Collection Annotation screen next to "Upload Images" and "View Project". Click on the button and a CSV file will be downloaded to your computer.
- B. You also have the ability to run an export file based on a specific search as outlined in Chapter 5 above.
- C. Once you download the CSV file, it will contain the resultant data of your image uploads in a variety of categories or columns.
 - i. Collection Name
 - ii. Image Name
 - iii. Scientific Name
 - iv. Common Name
 - v. Image Timestamp
 - vi. Prediction Score
 - vii. Tags (any manually added tags)