

PITMAR TUTORIALS

Use of the database and photo-identification algorithm.

- Access
- How to perform a search of the database
- How to preprocess pictures
- How to create a search by scales pattern
- How to create a file for a non registered individual
- Creating a new sighting for a non registered individual

ACCESS

The use of PITMAR is completely free at all levels but, for safety reasons, registration to access the database and photo-identification algorithm is required.

User LEVELS (all levels require registration)

The target groups of users of PITMAR are researchers, biologist, field workers and the staff of sea turtle rehabilitation facilities; but not exclusively.

Everyone interested in sea turtle tracking or just scientifically curious is welcome.

Also professional divers (or occasional snorkelers), fishermen, aquaculture staff, and so on, are a valuable source of pictures and information for individual sightings once the data are confirmed.

For that reason there are different user levels with different interaction permissions inside PITMAR (visitors / external operators / Neotropico Foundation operators).

Visitors are registered users just allowed to search the database but not to register new individuals or sightings in the database. They can send the results of their search (from inside the application) to our operators to validate a positive recognition (meaning a new sighting) or a negative search result (meaning a non registered individual). If they provide valid photographs of new records or sightings, once proven, our system operators generate a new record with the data provided (but always respecting the authorship of the information showing in the record the author of the sighting). Login requires application form, you can find it here:

<http://www.pitmar.net/index.php/2014-05-26-20-05-30/2014-05-26-20-05-56/visitantes>

External operators are registered biologist, veterinarians, researchers and field workers directly involved in marine turtle management or conservation, belonging to scientific institutions and research centers. They are allowed to create or modify their own records of new specimens or sightings and can search the database using the algorithm or searching tools.

They can also generate new files for non registered turtles or new sightings for registered ones. Login under this section requires an application form and an official letter of request from the entity, you can find the form here:

<http://www.pitmar.net/index.php/2014-05-26-20-05-30/2014-05-26-20-05-56/formulario-usuario-externo>

Formal letter of request for external operators (standard format model):

-Name of the applicant Entity.

-Entity Name (full mailing address, country, phone, e-mail, website).

-Responsible of the entity requesting the External Operator registry (Name, position held in the Entity, e-mail and phone number).

-Full name of the External Operator proposed. Contact details.

-Date and signature.

Neotropico Foundation operators are our own staff with authorization to create new users and entrusted with the protection and well functioning of the algorithm and database.

Having completed all the registration process, in a maximum of 48 hours you will receive an email confirmation of your data and you can access the system from that point.

Direct access to the algorithm: <http://prog.pitmar.net>. General Contact mail:

pitmar@neotropico.org

MAKING A QUERY ON DATABASE

If you have already logged in using your username and password, you will notice (at the top of the home page) a tab called Individuals.

Place the cursor over it and a submenú, with three options, will appear (select one by clicking on it):

- Search for Individual using Identifier
- Search for Individual using Picture
- Add new Individual manually

Search Individual by Identifier

If you want to find a particular individual and you know its PITMAR identification code you can enter it in the empty box. PITMAR code is composed of three data sets. The first corresponds to the year in which the individuals was recorded (not the year in which the sighting occurred), the second is the acronym assigned to the species (first

three letters of the genus and first three letters of the species) and the third is a number assigned automatically by PITMAR for this individual.

The species acronym are as follows:

Carcar: *Caretta caretta* (Linnaeus, 1758)

Chemyd: *Chelonina mydas* (Linnaeus, 1758)

Dercor: *Dermochelys coriacea* (Vandelli, 1761)

Ereimb: *Eretmochelys imbricata* (Linnaeus, 1766)

Lepkem: *Lepidochelys kempii* (Garman, 1880)

Lepoli: *Lepidochelys olivacea* (Eschscholtz, 1829)

Natdep: *Natator depressa* (Garman, 1880)

Example: The identification code 2014-Carcar-1 corresponds to an individual recorded in 2014, the species is *Caretta caretta* and the individual was designated by PITMAR with the number 1.

If we want a list of all registered individuals of a given species in a given year we can leave empty the PITMAR identifier box and all individuals matching the criteria selected (species and year) are displayed.

If you have a transponder (PIT) number, ring code, your own code or any other brand we can use the box: *Search by other identifiers*.

If we use the box *Search by other identifiers* empty, the program will locate all the individuals having some other code apart from that generated by PITMAR. Specimens which have only a PITMAR ID code but no other identifier are not displayed.

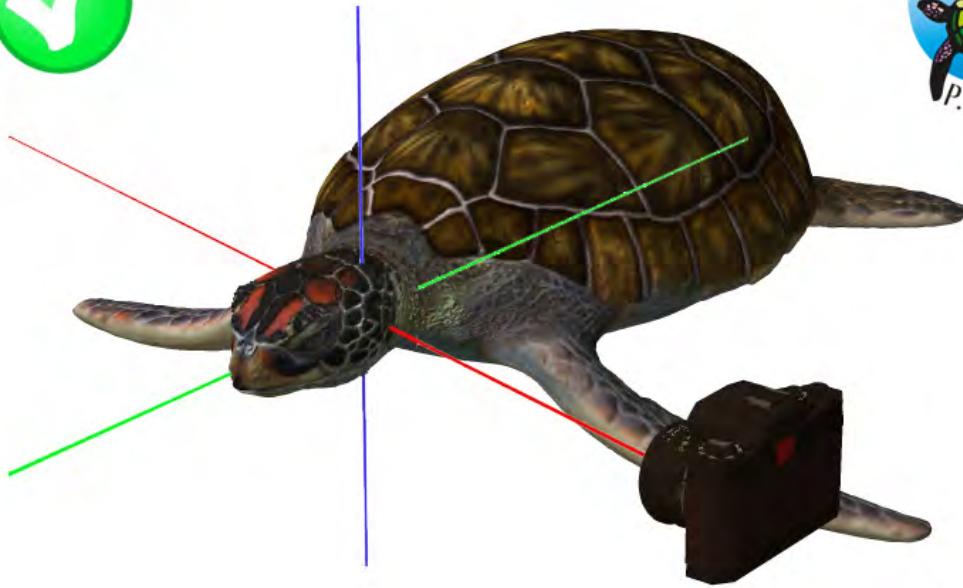
HOW TO MAKE PICTURE PRETREATMENT

For correct identification of specimens using PITMAR algorithm, the images should have at least some quality characteristics about the dimensions, orientation, lighting and level of definition that clearly allow delimitation of the scales.

Using some image processing software is recommended to improve the outcome of the original picture.

It is useful to rotate the image until the head of the turtle comes completely parallel to the ground and crop the image to fully fill the photograph. Once cropped the photo, it is recommended to resize the image width to 800 pixels. The resulting file should not exceed 1 Megabytes.

It is important that the picture is as sharp as possible (on focus), with good light. The angle of inclination of the face of the turtle respect the photographer and the substrate where it is placed should as close as possible to 90 °. See picture below.



Correct orientation and angle of the camera when taking the picture.



Correct Picture. Good orientation, framing, lighting, focus and definition.



Incorrect Picture. Good direction, good lighting but incorrect focus. It so unsharp that it is not possible to distinguish clearly the limits of the scales.



Valid Picture. Distant but with good orientation, lighting and focus. If the definition is good enough (pixel x pixel), you can zoom and crop. Correct for photo-identification.



Above picture after software magnifying, enlightening and sharpening. Correct for photo-identification.



Invalid Picture. Good definition, focus and lighting but misdirection.

HOW TO GENERATE A SCALE PATTERN SEARCH

If you have already logged in with your username and password, you will notice at the top of the home page a tab called Individuals.

Place the cursor over it and a menu will appear with three options (select one by clicking on it):

- Search for Individual using Identifier
- Search for Individual using Picture
- Add new Individual manually

Select Search for Individual using Picture

This will take you to a page called Search by facial image where three sections are displayed:

- Queued Searches: Processes in which pictures have been uploaded to the search but the nodes pattern is not achieved or the button to start the search have not been pressed.
- In progress searches: Those in which the algorithm is working and analyzing all patterns of nodes in the database. The process usually takes between 8 and 10 minutes. After this time you need to refresh the page by pressing CONTROL F5 simultaneously or reloading the page in the browser.
- Finished Searches: History of searches performed and completed. Please periodically delete old search processes not accumulate them and waste memory.

In the top left of the page you will see a box labeled as New Search. Click on it and you will be taken to a new page where you can load the sighting details (date, location, species), basic physical data and both right and left side pictures of the turtle's face. If you only have the picture of one side of the face, anyway you can search the specimen.

In the bottom of the page you will find two boxes Click on them to select the location of the files of the images on each side of the face. Once done, click Send.

Once the time needed to send the files (depending on the speed of your internet connection) is elapsed, you will arrive to a page indicating that the search has been successfully generated. The search has not yet begun, the time to mark the pattern formed by the nodes between each flake has come. You will find your query in Queued Searches. In the review of our new search it shows a Search identifier number, date and time of search generation, species, an edit box and a delete box. Click on the edit box to enter the search page. Review details and therefore, at the bottom of the page, you have two boxes with Not processed images message in red label. Click on one of them and the magnified picture will be shown. Underside you have three tabs:

[Edit nodes](#)

[Show/hide nodes](#)

[Back](#)

Click on [Edit nodes](#). You will Access to the nodes plotting page. Under the image you will see the following boxes

Add marks

Add nodes

Delete nodes

Help

Save image information Back

By pressing Help button, the following text will be displayed:

*Press the button "Add marks" to place both marking points. The first one has to be laid **in the joint of the two central supraocular scales** and the second one in **the upper arch of nostril**.*

Press button "Add nodes" to place scale intersection nodes for the individual.

You can move and edit the position of each node by clicking, dragging and dropping it in the correct place

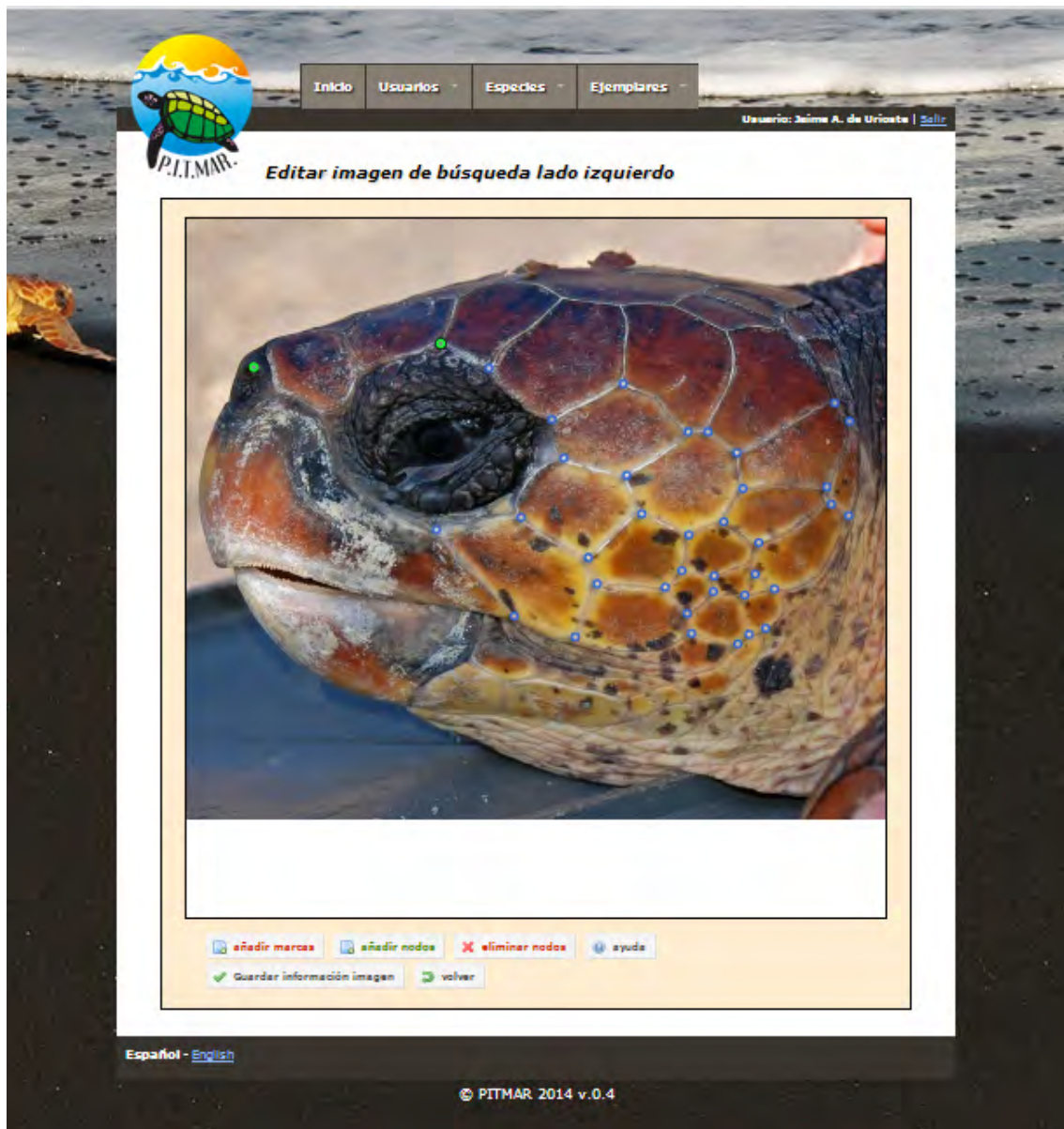
Press button "Delete node" and click to erase nodes or marks.

The marks appear as gray dots with green edge. You can correct or modify their position by clicking, dragging and dropping in the desired location. These marks are important to offset possible inclinations at the time of taking the picture and the displacement of the nodes caused by the growth of the individual.

The nodes appear as gray dots with blue edge.

You can move the marked points or nodes by clicking on them with the mouse, drag and drop them in the desired location. This point cloud is what the program uses to identify the individual. If it is difficult to see the limits of some scales you can enlarge the image by pressing (Ctrl and + to) zoom in or (Control and -) to zoom out. To restore the original screen size just press (Ctrl 0).

Press the delete button and erase node marking points by clicking on them.



When you consider that you have finished marking all possible nodes press *Save image information*.

You will be directed back to the previous page, there you will see the image you just have edited labeled in green as *Processed image*. Do the same with the picture of the opposite side.

When both images are processed (or one if you only have one), to perform search, press *Start search* button just above the picture boxes and you will be returned to the *Search by facial image* page, the process disappears from *Queued searches* and is shown at *In Progress Searches* section. After 8 to 10 minutes refresh the page or recharge it by clicking Ctrl and F5. If it still is shown as *In Progress*, wait 5 minutes more and try it again until the search is finished.

When your search appears in the *Finished searches*, click on the *Search results* box to see the results. This will take you to a page called *Search results* showing *Individuals found for search* (ID search).

In descending order of importance 15 individuals with the highest number of matching nodes are displayed. Browse between each of the results to visually locate the matching individual. If the source image is of good quality, correctly labeled nodes and no matching individual is found, this means that it would be a non registered turtle. In the bottom of the results page you will see a tab: *Generate a new Individual* (only available for registered External Operators, not for Visitors). Click on it and follow the instructions. Once generated the individual profile complete the new record with the available data that has not already been automatically included.

When you enter to each of the potential positive identification results a page with information about that individual will be open.

You will see your searched images facing the corresponding potential matching individual.

Clicking on each image will be magnified displaying pattern nodes and image comparison with several boxes for hiding image or nodes.

You can also restart the search for the same individual by modifying or correcting the position of the nodes.

If you find a matching individual just click merge button and follow the instructions.

CREATING A FILE FOR A NON REGISTERED INDIVIDUAL

If you have already logged in with your username and password, you will notice at the top of the home page a tab called Individuals.

Place the cursor over it and a menu will appear with three options (select one by clicking on it):

- Search for Individual using Identifier
- Search for Individual using Picture
- Add new Individual manually

Click on *Add new Individual manually*. Fill in the information of each item and press the submit button.

After creating the individual profile click the *Add a new sighting* tab. Locate on the map the location of the sighting, coordinates data will be automatically found, add and fill the rest of the requested data. You can add a general picture of the turtle and include features in the Observations section.

CREATING A NEW SIGHTING FOR A REGISTERED INDIVIDUAL

After finding or creating the individual profile click the *Add a new sighting* tab. Locate on the map the location of the sighting, coordinates data will be automatically found, add and fill the rest of the requested data. You can add a general picture of the turtle and include features in the Observations section.