

Caltech Birds 200 Database

Takeshi Mita

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1 Description

6,033 bird images belonging to 200 categories. About 20 to 40 images per category. Collected in January 2009 by Takeshi Mita. All images were downloaded from Flickr.com. Maximum dimension of each image is 500 pixels. All images are roughly segmented, annotation data is on the “Birds200_Annotations”. There are matlab scripts to view the categories and the annotations, “show_categories.m” and “show_annotation.m”, respectively. Some bird categories are very similar with each other as shown in Figure 1.



Figure 1: Similar species (Left: Field sparrow, Right: Lincoln sparrow).

2 How were the images collected?

2.1 A list of bird names

A list of 278 bird names was obtained from <http://www.birdfieldguide.com/>.

2.2 Wikipedia images

We downloaded images from Wikipedia according to the bird name list. The Wikipedia images are reliable because they were selected by bird experts, however most articles have only one image. So, we use them for collecting and annotating other images as described in the following sections. There are several articles in Wikipedia which have no bird image. Those bird names were removed from the list.

2.3 Flickr images

More images were retrieved and downloaded from Flickr.com. We downloaded only photos whose titles included the bird names. An example of a filename of a downloaded image is “Black_footed_Albatross_0001_2950163169.jpg.” “0001” is an index number and “2950163169” is a photo ID on Flickr.com. The photo IDs could be used for downloading images with higher resolution. Some images are no longer available on Flickr because they have already been removed by their owners. Their filenames are like “Black_footed_Albatross_0001_xxx.jpg.”

Bird categories who have less than 20 images were removed from the list. We had 224 bird species at this time.

2.4 NOTE

The images downloaded from Wikipedia are NOT included in this database because some of them were also downloaded from Flickr and many of them are not real bird photos but drawings.

Some images in the database contain multiple birds.

3 How were the images annotated?

We used the Amazon Mechanical Turk for annotating the images. We asked workers the following three things:

- to trace a bird boundary as shown in Figure 2,
- to compare the second image with the first template image and choose one from “same”, “similar”, “different” and “difficult” for similarity between the two images,
- to select “multiple” if there are two or more birds in the second image.

Each image was annotated by two workers. We selected images two workers chose “same” or “similar” and they were checked by us. Therefore, all images in the database were looked by three different people. Although they are not experts of birds, we believe most images belong to their correct categories.

We excluded categories which have less than 20 images. We have 200 categories now.

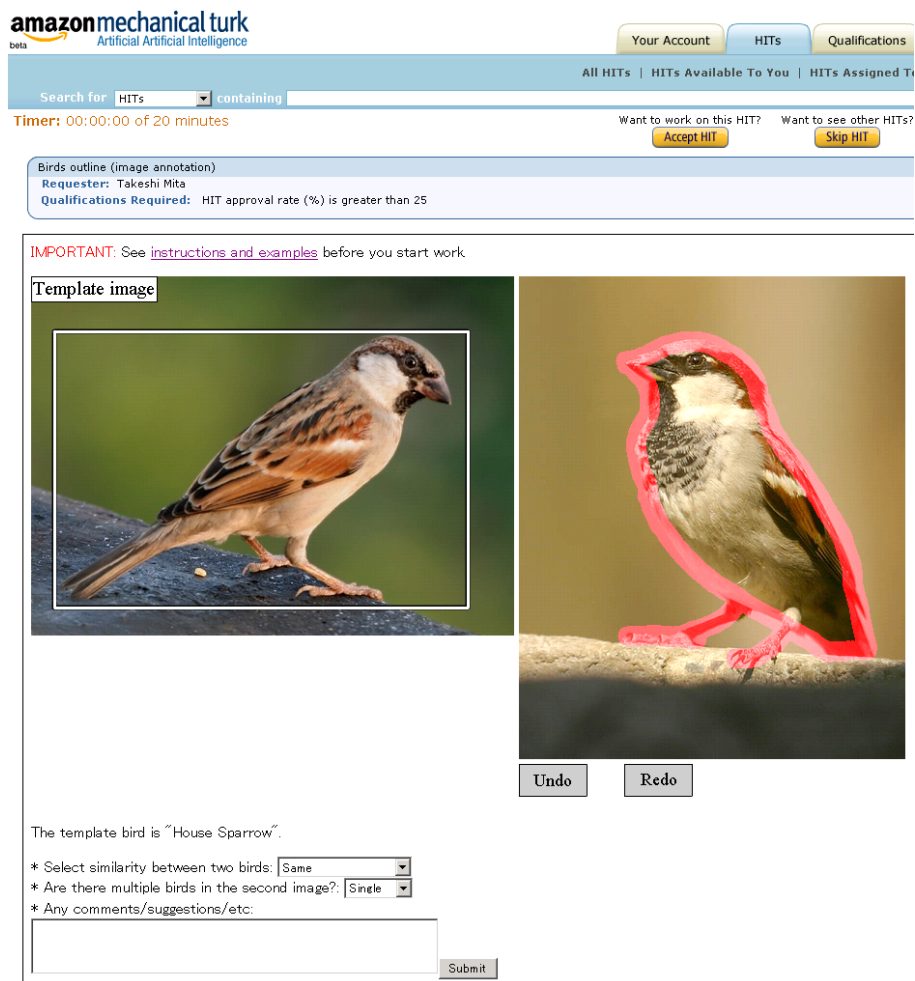


Figure 2: An annotation interface on Amazon Mechanical Turk. Left image is a Wikipedia image used as a template. Right image is a Flickr image which needed to be annotated. A worker traces the bird boundary (indicated by red in the right image) and answers similarity between these two birds and if there are multiple birds in the second image.

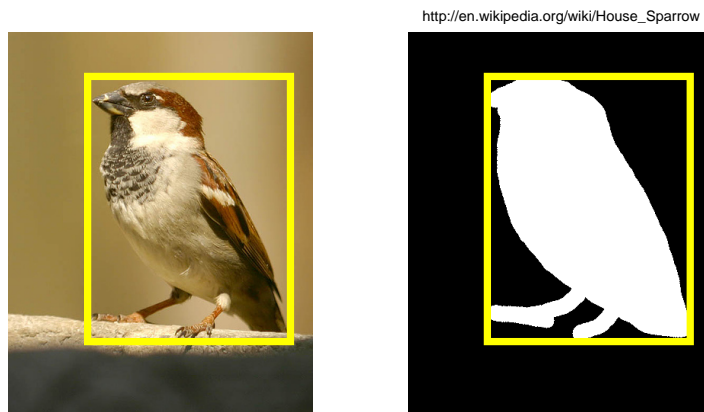


Figure 3: An annotated example. The yellow box is the smallest bounding box which contains segmented bird region (right image). The corresponding Wikipedia URL is also included.