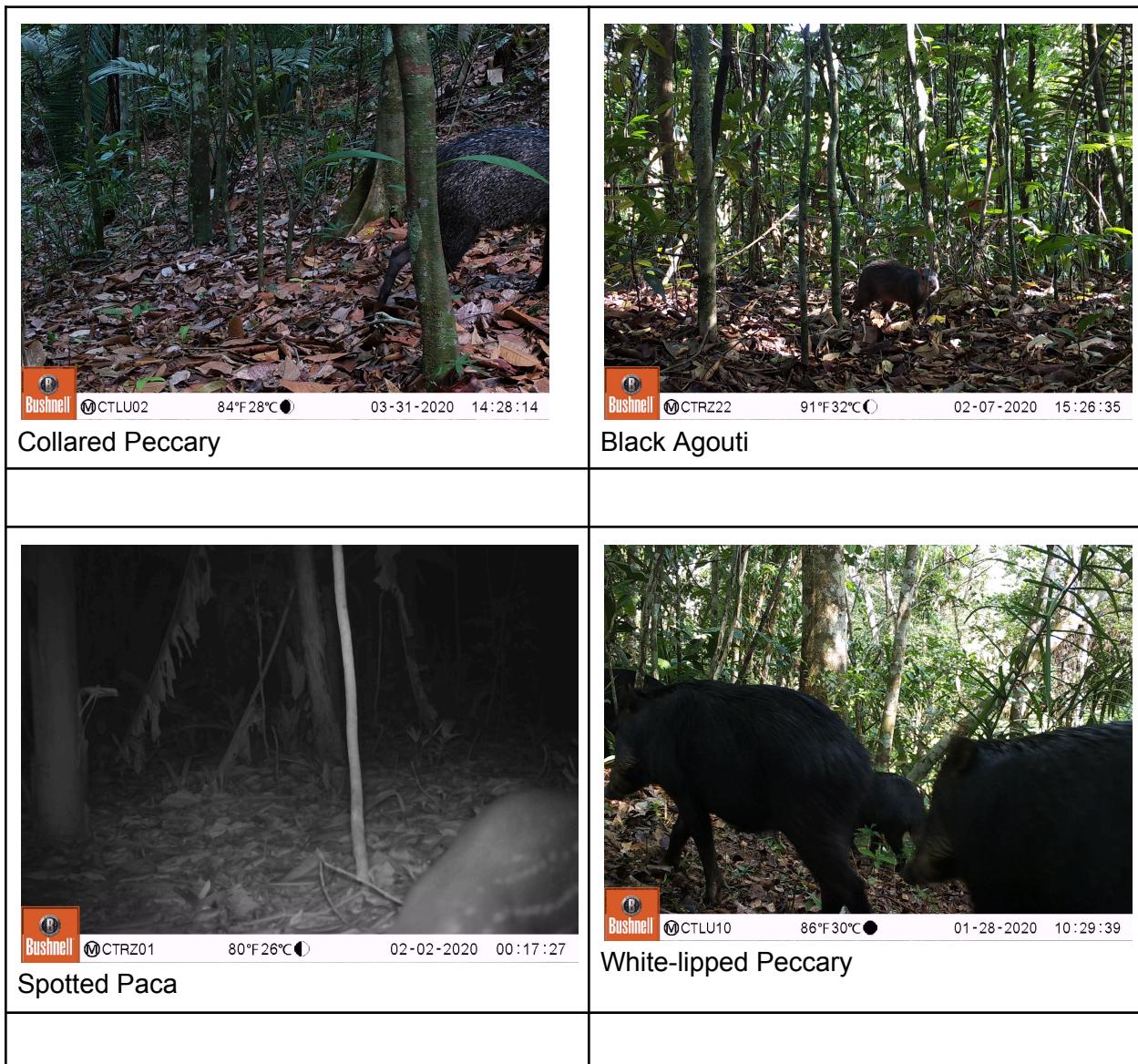


Colombian Wildlife Classification

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Link to Dataset: [Orinoquía Camera Traps - LILA BC](#)

Example Images





Bushnell M CTLU04 77°F 25°C 03-20-2020 21:09:34

Dasypus Species



Bushnell M CTRZ04 83°F 28°C 05-09-2020 15:54:34

South American Coati



Bushnell M CTRZ08 84°F 28°C 05-09-2020 16:31:13

Domestic Horse



Bushnell M CTRZ12 91°F 32°C 02-28-2020 13:43:26

Bos Species

Variation in the Dataset

Categories and Volume

The dataset¹ contains more than 100k images collected from 50 different cameras deployed in 2 natural reserves. There are 51 animal species identified from the images, with approximately 20% of the images are empty (i.e. no animals captured), in total there are 52 classes (51 species + empty images) available for classification. The classes are of varying size ranging from only 1 to over 20k for the non-empty images. For this project, instead of the full dataset, we are going to use non-empty images from top classes in cameras with most images captured.

We will classify 8 species of animals from selected cameras as proposed below, which currently have the following number of images per class. However, we may consider grouping classes of visually similar animal species (e.g. Collared Peccary & White-lipped Peccary) and will downsample categories in order to achieve a class-balanced dataset.

Species	Number of images
Collared Peccary	15853
Black Agouti	6779
Spotted Paca	2627
White-lipped Peccary	1974
Dasyurus Species	1673
South American Coati	1154
Domestic Horse	950
Bos Species	903

Colors and Resolution

Our dataset contains both colored images taken at daytime and monochrome images taken by infrared flash at nighttime. Subject to further image analysis, we may limit to only using the colored images, or choose to augment both image types into grayscale images so that the resulting solution will be more generalized to classify images taken at any time of the day.

¹ Vélez, J., McShea, W., Shamon, H., Castiblanco-Camacho, P. J., Tabak, M. A., Chalmers, C., Fergus, P. and J. Fieberg. 2023. An evaluation of platforms for processing camera-trap data using artificial intelligence. *Methods in Ecology and Evolution*, 14, 459– 477. <https://doi.org/10.1111/2041-210X.14044>

The resolution of both types of images is 1440 by 1920, and the datatype is uint8. There is a banner region at the bottom of every image showing camera, temperature and timestamp information which we may remove during pre-processing.

Intended Classification Problem

Output Categories

We want to classify into the following categories as discussed above:

1. Collared Peccary
2. Black Agouti
3. Spotted Paca
4. White-lipped Peccary
5. Dasypus Species (armadillos)
6. South American Coati
7. Domestic Horse
8. Bos Species (cattle)

Potential Useful Image Features

Distinctive Characteristics from Edges

Some species have distinctive characteristics that serve as natural feature vectors. For example, the Armadillo (Dasypus Species), South American Coati, and the Spotted Paca display unique patterns from which high frequencies can be extracted. The White Lipped Peccary has a white spot on its snout, which could be extracted with a corner feature. Likewise, the Collared Peccary has a white strip against its collar, making edge detection and gradient orientation (e.g. from HOG) useful features.

Image Differencing

We also plan to use image differencing to create masks for our images, as our dataset comes from fixed camera traps with a constant background. This approach will be particularly effective for identifying the Black Agouti in colored images.

Additionally, image differencing is advantageous for capturing animal movement, since most animals were observed moving in front of the camera. When an animal's features are obscured and difficult to classify, the species might still be inferred from images taken before/after sudden movement. This should effectively classify uncertain images.