make\_mask\_rcnn\_data: folders were the files to generate instance segmentation model train data with an heuristic

backgorunds: folder where random backgrounds should be placed to Ethoflow get.

mask\_imgs: folder where Ethoflow saves the images to train instance segmentation model

mask\_video\_tests: video example to Ethoflow run heurist and to test after training

train: examples of the images generate to train Ethoflow to recognize bees (*Melipona quadrifasciata*) in random background

val: examples of the images generate to validate Ethoflow in recognition of the bees (*M. quadrifasciata*) in random background

\*\*Obs.:\*\* after generate images, paste to: train\_mask\_rcnn/Mask\_RCNN/dataset

train\_mask\_rcnn: After generate the dataset (in make\_mask\_rcnn\_data), we recommend upload this folder in Google colab to train the model.

logs: when training a model, it will be saved in this folder train\_mask\_rcnn/Mask\_RCNN/logs. Paste this model in the train\_mask\_rcnn / logs folder to be able to inspect the model

Mask\_RCNN: files needed to Ethoflow run instance segmentation model.

Inspect\_trained\_model: notebook to check the trained model

Train\_instance\_segmentation: notebook to train instance segmentation model

complex\_behavior: folder with files to train the model in recognition complex behavior

cnn: it contains a notebook to train the model, a file with necessary functions and data example

train\_imgs\_behavior: example of data about complex behavior (trophallaxis) in stingless bee \*Melipona quadrifasciata\*

utils: it contains files with functions to run into Ethoflow

videos\_example\_ethoflow: examples of files processed with Ethoflow

(Bernardes, Lima, Guedes, & Martins, 2020)

Bernardes, R. C., Lima, M. A. P., Guedes, R. N. C., & Martins, G. F. (2020). Ethoflow: computer vision and artificial intelligence-based software for automatic behavior analysis. *BioRxiv*, 2020.07.23.218255. doi:10.1101/2020.07.23.218255