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Engineers for Exploration

**Creating Visualizations**

## PREREQUISITES

* QGIS 3.4 and GDAL

## INSTRUCTIONS

This instruction guide will start from the very beginning of the process, however if you already have sorted output folders containing classified .tif files, skip to step \_\_.

1. If you don’t have a model yet, use retrain.py to retrain Inception V3 on the training data (.jpg files).
2. Once you have a model, use annotate.py (GPU version preferably) to perform inference on unclassified data (.jpg files).
3. Use organize.py to sort the .jpg images into folders based on the output result file generated by annotate.py.
4. Sort the .tif files corresponding to the .jpg files based on the .jpg classifications.
   1. Option 1: Create and run a python script to sort based on filenames.
   2. Option 2: Use a text editor to find and replace .jpg with .tif (assuming the rest of the file path is the same) in the result file outputted from step 2 and rerun organize.py on this new result file.
5. Use gdal\_merge.py to create orthomosaics from sorted .tif files. The command should be of the form python3 gdal\_merge.py -o “NAME AND PATH OF OUTPUT FILE” “PATH TO DIRECTORY CONTAINING INPUT IMAGES”/\*
   1. Replace text in quotes.
6. Drag resulting orthos into QGIS and adjust layer colors for visualization (use the singleband psuedocolor option in the layer properties). Finally, export the visualization.
   1. Open m\_ortho.tif in QGIS
   2. Select Raster > Raster Calculator, and input the following expression to create a mask: "m\_ortho@4">0. Give the mask layer a name, ex: “m\_ortho\_mask”. This should set all non-transparent pixels to white (1) and all transparent pixels to black (0)
   3. Right click on the new mask layer and go to “properties”. Navigate to “symbology” and change “render type” to “singleband pseudocolor”. Choose the color scale you want to use (only important values to choose are 0 and 1). Typically you will want to make the 0 value correspond to white with an opacity of 0. The 1 value should be the tile mask color (ex: green for m and red for nm) and pick an opacity level (25% seems to work well).
   4. To save your new layer, right click the layer name and navigate to export > save as and then select the rendered image option and set the output file location and save.
   5. Do this same process to nm\_ortho.tif
   6. Open a new QGIS project and drag and drop the site\_ortho and the new masks.
   7. Go to file > import/export > export map to image and input the desired output location. If the picture is too low resolution, change the dpi setting (1000 dpi seems to be good).

## REFERENCES

<https://gdal.org/programs/gdal_merge.html>