Week 5 Report

Wen Han Chia
(Lizard Classification)

Time-Log

Additionally, the time-log should include any work you've done for your *role* work (e.g., meeting management, web management, programs management, etc.)

What did you do this week?

- Held the 2nd Bi-Weekly Computational Advisor meeting with Computational Advisor
    - Created slides to present current progress of data annotation and exploration of the tools used (Roboflow, PACE)
    - Slides also contained visual information about the unique features of each anole
- Meeting Manager Role
    - Recorded meeting, uploaded it to HAAG Youtube Channel and sent it on both Teams and Slack channels
- Preliminary Data analysis and annotation
    - Gathered information about the unique visual features about each Anole Species
    - Analyzed image dataset and listed possible explanations for noises and classification models' drop in performance
    - Signed up for Research Plan from Roboflow, acquired free credits. Utilized free credits to annotate more image dataset
- Refined Project Methods document
    - Followed Breanna's recommendation to keep methods concise
    - Discussed with Computational Advisor and agreed on the project method's feasibility
    - Drafted the third iteration of Methods document

What are you going to do next week

- Continue annotating lizard dataset
- Will explore fine-tuning vision models using PACE ICE

Blockers, things you want to flag, problems, etc.

- Limited credits from Roboflow software limits the amount of annotations that can be done

Abstracts:

Lin, Tsung-Yi, et al. *Focal Loss for Dense Object Detection*. arXiv:1708.02002, arXiv, 7 Feb. 2018. *arXiv.org*, https://doi.org/10.48550/arXiv.1708.02002.

The highest accuracy object detectors to date are based on a two-stage approach popularized by R-CNN, where a classifier is applied to a sparse set of candidate object locations. In contrast, one-stage detectors that are applied over a regular, dense sampling of possible object locations have the potential to be faster and simpler, but have trailed the accuracy of two-stage detectors thus far. In this paper, we investigate why this is the case. We discover that the extreme foreground-background class imbalance encountered during training of dense detectors is the central cause. We propose to address this class imbalance by reshaping the standard cross entropy loss such that it down-weights the loss assigned to well-classified examples. Our novel Focal Loss focuses training on a sparse set of hard examples and prevents the vast number of easy negatives from overwhelming the detector during training. To evaluate the effectiveness of our loss, we design and train a simple dense detector we call RetinaNet. Our results show that when trained with the focal loss, RetinaNet is able to match the speed of previous one-stage detectors while surpassing the accuracy of all existing state-of-the-art two-stage detectors. Code is at: https://github.com/facebookresearch/Detectron

What did you do and prove it

1. Continued annotating on Roboflow
   - Used the auto-labelling function to label more images (4000 images)
   - Reviewed 2000 of the labelled images and manually labelled images that failed at the auto-labelling process
   - Images 1 and 2 capture the counts of annotated and reviewed images from 2 separate accounts (both accounts are mine)
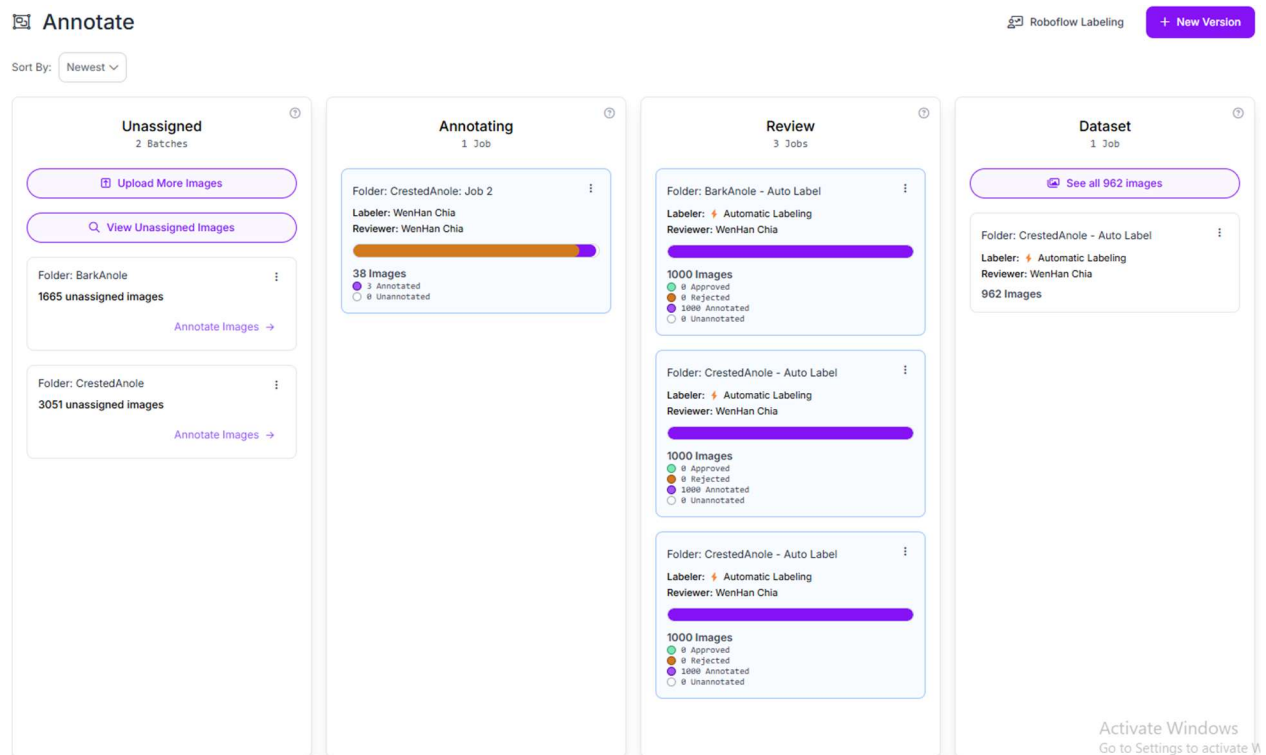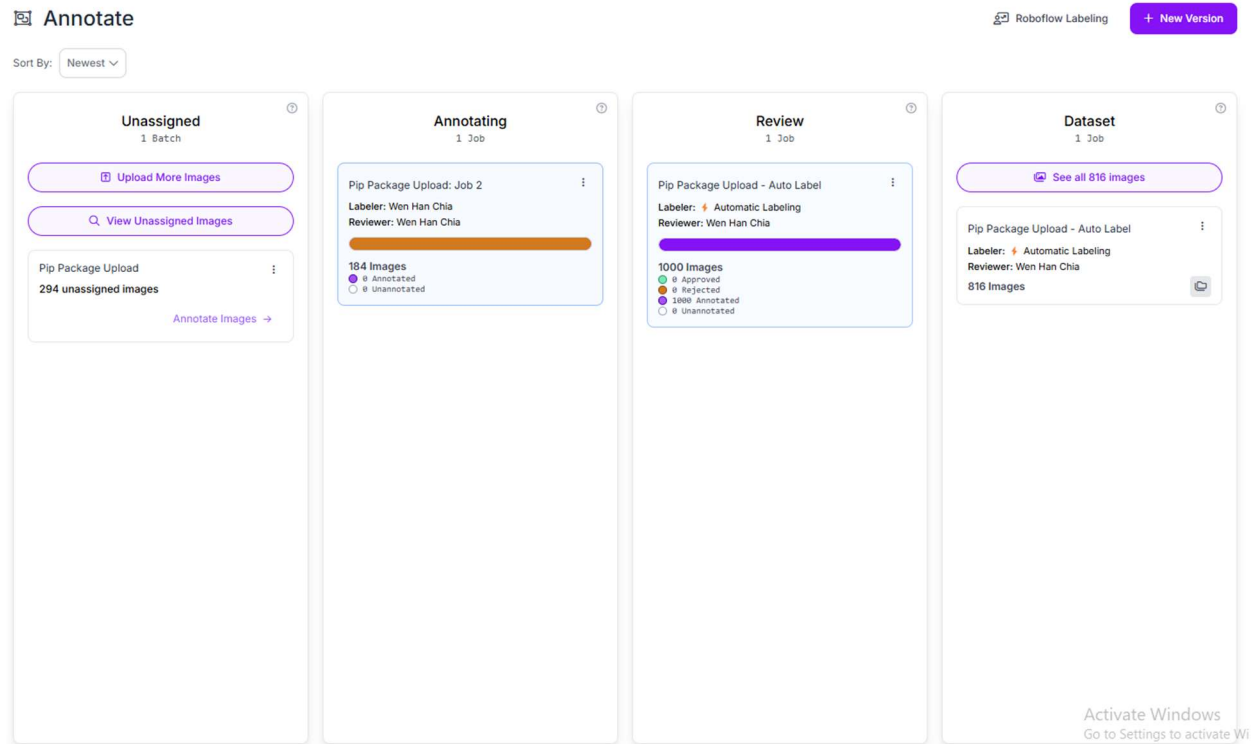

Image 1

Image 2

2. Gathered information about the unique features of Anole species and presented to Computational Advisor

- o The images below display the snippet of the slides that contained the description and visual information of the unique features that help to identify each Anole species

Knight Anole

Usually a brilliant green color, but sometimes changing to a deep brown. This species has two light yellow or white stripes, one along its upper lip and the other on its shoulder. No other anole in Miami has such a large and bony head.

Knight anoles are bigger and are bright green with a white or yellow stripe extending over the shoulder and eye. The knight anoles' snout is long and shaped like a wedge, while the tail is compressed with a ragged upper edge [Source]

Source:https://www.inaturalist.org/guide_taxa/627663

Crested Anole

The Crested Anole is olive-tan to almost black in color and individual lizards can change color. Broad bands on the body and tail can be found on some individuals. The easiest distinguishing feature, as the name suggests, is the prominent crest found on the tail of adult males – but not all males have tail crests! This species is easily confused with the Brown Anole, which is about the same size and similar in behavior and habits. As compared to the Brown Anole, the Crested Anole has a light ring around the eye and a light stripe above the front limb. Also, females have a cream-colored stripe in the middle of their back.

Source:https://www.inaturalist.org/guide_taxa/627660

Bark Anole

Males have white to yellow dewlaps, sometimes with an orange spot. Their bodies can be gray to yellowish brown, sometimes greenish, and their tails are usually banded yellow with black at the tip. They have a dark bar on the top of their head between their eyes, a light ring around their eye, and light and dark flecks of variable size covering much of their body.

Bark Anole

Anolis distichus

Source:https://www.inaturalist.org/guide_taxa/627662

Green Anole

Males usually have a bright pink to reddish dewlap, and when displaying they often have a crest along their head and neck and a black patch between their eye and ear opening. Females have a light line along the middle of their back. The only other all green anole in Miami is the Jamaican Giant Anole, which is somewhat larger and has a yellow dewlap. Green Anoles have longer and pointier snouts than other anoles in Miami.

Green Anole

Anolis carolinensis

Source:https://www.inaturalist.org/guide_taxa/627659

Brown Anole

Males have <u>red-orange dewlaps</u>, sometimes with a <u>yellow border or blotches</u>. Females often have a pattern with diamonds, bars, or a stripe running down their back, whereas Crested Anole females only have a cream-colored stripe. Unlike Crested Anoles, <u>Brown Anoles do not have a light ring around the eye or a light stripe above the front limb</u>. Instead, they often have <u>two dark bars above their eyes. These guys are never green!</u>

Brown Anole

Copy   ‹ Pre

Anolis sagrei