

# Week 3 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?

- Meeting Manager Role
  - o Sent transcript and video recording of bi-weekly meeting with Computation Advisor to Slack channel and Planner app
- Drafted and resubmitted the Methods document
- Attended Bi-weekly meeting with Computational Advisor, Ilia Jahanshahi, and Breanna
  - o Discussed the direction of the project
  - o Agreed upon a set of deliverables by next meeting
- Setup project's python environment and consolidated a .yaml file for future uses
- Downloaded a subset of the data on personal laptop for quick analysis

### What are you going to do next week

- Organize and pose a list of questions to Dr Stroud to better understand Lizard's distinct features
- Annotate dataset with bounding boxes via Roboflow or manual annotation

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

- Approval for PACE access

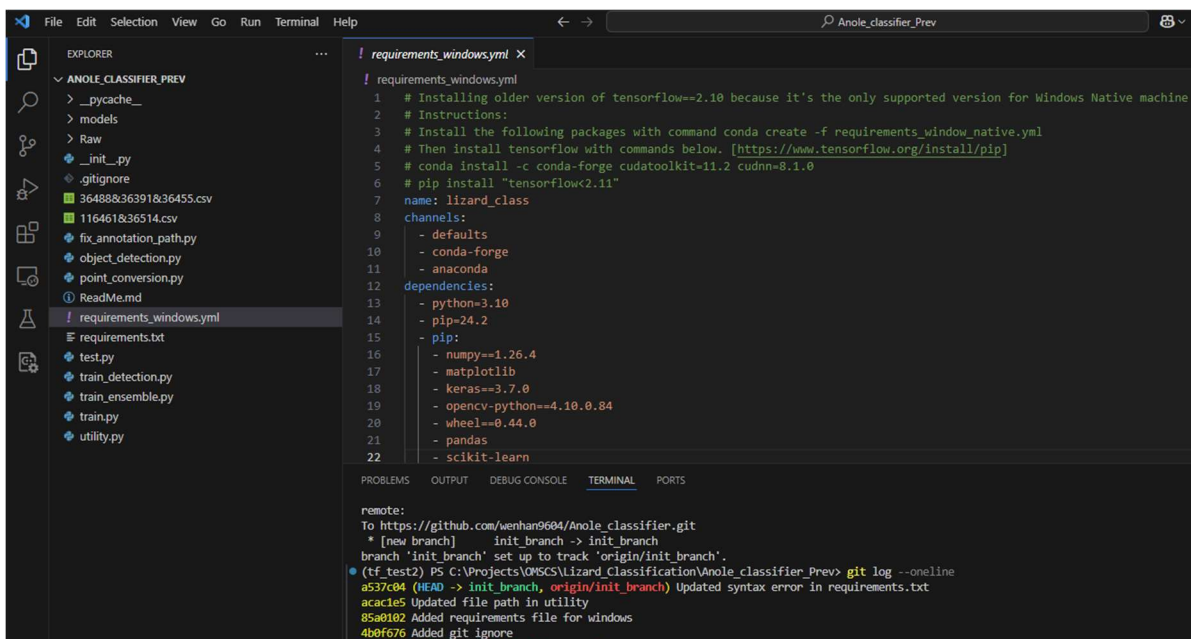
## Abstracts:

Wu, Yue, et al. 'Rethinking Classification and Localization for Object Detection'. 2020 *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, IEEE, 2020, pp. 10183–92. DOI.org (Crossref), <https://doi.org/10.1109/CVPR42600.2020.01020>.

Two head structures (i.e. fully connected head and convolution head) have been widely used in R-CNN based detectors for classification and localization tasks. However, there is a lack of understanding of how does these two head structures work for these two tasks. To address this issue, we perform a thorough analysis and find an interesting fact that the two head structures have opposite preferences towards the two tasks. Specifically, the fully connected head (fc-head) is more suitable for the classification task, while the convolution head (conv-head) is more suitable for the localization task. Furthermore, we examine the output feature maps of both heads and find that fc-head has more spatial sensitivity than conv-head. Thus, fc-head has more capability to distinguish a complete object from part of an object, but is not robust to regress the whole object. Based upon these findings, we propose a Double-Head method, which has a fully connected head focusing on classification and a convolution head for bounding box regression. Without bells and whistles, our method gains +3.5 and +2.8 AP on MS COCO dataset from Feature Pyramid Network (FPN) baselines with ResNet-50 and ResNet-101 backbones, respectively.

## What did you do and prove it

1. Created a different requirements.yml file to setup python environment that consists of tensorflow package in a Windows Native device.
  - The reason for doing so, despite already having a requirements.txt file from the previous contributor, was because the existing requirements.txt file could not support the installation of tensorflow on a Windows Native device
  - The newly created .yml file also included steps to install tensorflow on Windows Native devices before installing the rest of the required package
  - Link to Github - [https://github.com/wenhan9604/Anole\\_classifier.git](https://github.com/wenhan9604/Anole_classifier.git)
  - The screenshot below shows the .yml file as well as the git commit history



```
requirements_windows.yml
1 # Installing older version of tensorflow==2.10 because it's the only supported version for Windows Native machine
2 # Instructions:
3 # Install the following packages with command conda create -f requirements_window_native.yml
4 # Then install tensorflow with commands below. [https://www.tensorflow.org/install/pip]
5 # conda install -c conda-forge cudatoolkit=11.2 cudnn=8.1.0
6 # pip install "tensorflow<2.11"
7 name: lizard_class
8 channels:
9   - defaults
10  - conda-forge
11  - anaconda
12 dependencies:
13   - python=3.10
14   - pip=24.2
15   - pip:
16     - numpy==1.26.4
17     - matplotlib
18     - keras==3.7.0
19     - opencv-python==4.10.0.84
20     - wheel==0.44.0
21     - pandas
22     - scikit-learn
```

```
remote:
To https://github.com/wenhan9604/Anole_classifier.git
* [new branch]      init_branch -> init_branch
branch 'init_branch' set up to track 'origin/init_branch'.
(tf_test2) PS C:\Projects\VMSCS\Lizard_Classification\Anole_classifier_Prev> git log --oneline
a537c04 (HEAD -> init_branch, origin/init_branch) Updated syntax error in requirements.txt
acac1e5 Updated file path in utility
85a0102 Added requirements file for windows
4b0f676 Added git ignore
```

2. Downloaded >50% of the data for quick analysis
  - a. I have downloaded close to ~100k of the ~170k images
  - b. Reason for downloading dataset is for quick visual analysis and understanding of the dataset
  - c. Screenshot below shows a screenshot of the downloaded images

