WEEKLY REPORT and MEETING AGENDA

Report #: 4 Project Name: Traffic Light Detection and Tracking
Date: 2/28/23 Prepared by: Morgan Roberts

Agenda for the weekly meeting

1. Ask questions about how to output data (ONNX format?)
2. What do clients recommend training on? Access to Grace cluster?
3. What are the specs of the car? Does the brand of GPU matter?
4. Aside from traffic light data, are we meant to select “our” traffic light?
    - That is, do we need to specify the traffic light in our car’s lane?
    - Seems to be outside of our project (lane detection team’s data would help)
5. We are encouraged to partition the image to improve performance. How should we go about doing this? We don’t want to miss traffic lights with this approach.
    - Fixed crop? chop half of the image off?
    - Variable crop? via calibration when the system starts?

Accomplishments during this period

Configure a pre trained YOLOv8 model

1. Was trained to detect traffic lights
2. When fed footage, was able to detect traffic lights fairly well
    - Due to training data, was not able to detect type or color
    - Detected back of traffic lights as well, which we don’t want
3. The medium sized model ran fairly slowly on the cpu, but was still usable
    - This is good for us because we will have better specs
    - We plan to run on a smaller model with access to gpu

Plans for next period

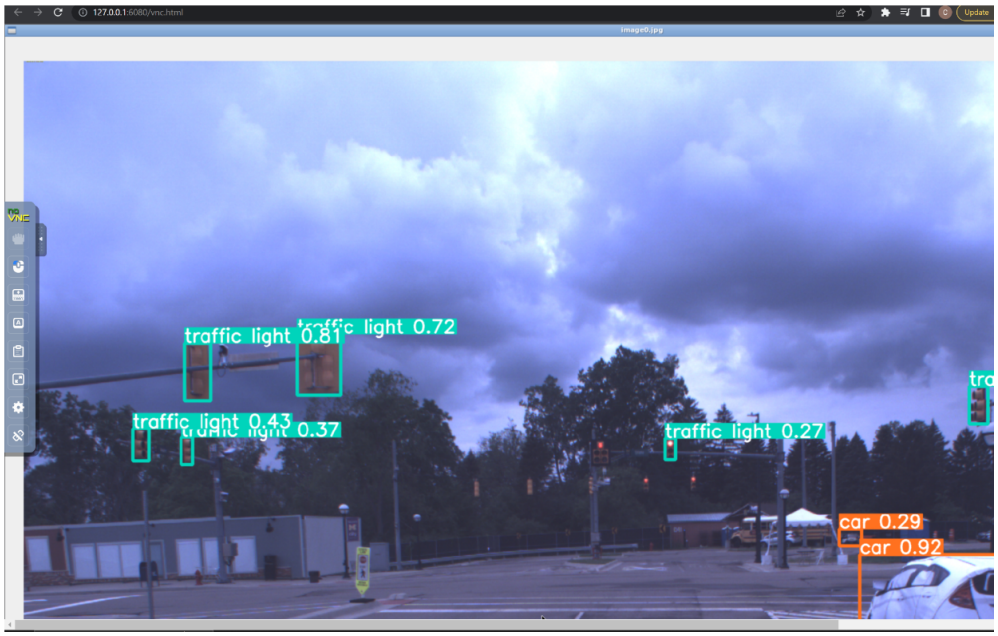
1. Research ROS and Docker to help with github synchronization
    - Which files can be ignored?
2. Begin to train model on Lisa Dataset with yolo, pytorch
    - research pytorch and other python libs we need

Project management status

1. Schedule and milestones
    - Got pretrained model working with ROS
    - Tested speed and accuracy with differently sized models
2. Teamwork
    - Collaborated on thursday in-person and sunday online
3. Purchases
    - None

Minutes from previous meeting

(Morgan, Clayton, Aaryan, Max)

- Located in EABA
- Prof emphasizes moving into action phase
- Clayton mentions that he was able to use a pre trained model with YOLOv8
- 

- Prof mentions that we should cut off the input image since lights are not found everywhere in the image.
- Prof offers rtx 3090 machine to use for training.
- Car does not use nvidia, uses intel enterprise gpu
- There are different types of traffic lights in different states
    - Texas uses horizontal, but others use vertical
    - “dog house” traffic lights (5 lights in one)
- Also, we can train on railroad crossing lights for a bonus
- Aaryan asks what method we use to partition the image
    - If you don’t know area, designate sample area
    - Set it in a configuration file
- Max brings up setting up a “box” to designate this area.
- Final output is not determined yet (TBD)
- Do we need to output data as array of lights with types?
- Do we need to track our lane’s specific light (special)?
    - Yes, we do
- Need to complete ROS environment and post to github
- Todo: research ROS, docker, YOLO, machine learning frameworks, pytorch and ONNX