

Daily Log

Monday October 28

Worked on my presentation, and small tests on different methods

Tuesday October 29

Realized that the loss function in the ResNet50/YOLO classifier was wrong. I mostly spent time trying to understand how it works. Delivered my presentation and watched others present.

Thursday October 31

Same as Tuesday, spent more time researching and figuring out how to implement the custom loss function. Also, watched presentations of course.

Wednesday November 6

Worked on coding the new loss function.

Friday November 8

I finished coding the function and fixed bugs to get it ready to train.

Timeline

Date	Goal	Met
10/15	develop a running object detection framework	yes (well, kind of)
10/22	develop a running object detection framework able to detect logos in real-time	no - not yet
10/28	develop a running object detection framework able to detect logos in real-time at least 50 percent accuracy	no - not yet
11/4	develop a running object detection framework able to detect logos in real-time at least 80 percent accuracy	no - not yet
11/11	develop a running object detection framework able to detect logos in real-time and blur possible logos	no - not yet

Reflection

Even though I haven't achieved my goals recently, I'm actually very happy with my progress. Given, that my recent goals are extremely similar and how far ahead of schedule I am, I still think I'm in a good place. I anticipate that this is the most difficult part, as after the appropriate bounding boxes are produced, applying a blur function using opencv shouldn't be very difficult. The only other problem I see arising has to do with the trade-off between accuracy and performance, meaning that I want my network to blur logos in at least 30 fps, so it is viewable (preferably 60 fps, if I can get there). However, I'm hoping that detecting logos in 30 or more fps won't decrease the accuracy of the network's detections. I'm also glad I'm catching a lot of these bugs/problems in the framework early on, so I won't have to address them later.

loss function:

$$\begin{aligned}
& \lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} \left[(x_i - \hat{x}_i)^2 + (y_i - \hat{y}_i)^2 \right] \\
& + \lambda_{\text{coord}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} \left[\left(\sqrt{w_i} - \sqrt{\hat{w}_i} \right)^2 + \left(\sqrt{h_i} - \sqrt{\hat{h}_i} \right)^2 \right] \\
& + \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{obj}} (C_i - \hat{C}_i)^2 \\
& + \lambda_{\text{noobj}} \sum_{i=0}^{S^2} \sum_{j=0}^B \mathbb{1}_{ij}^{\text{noobj}} (C_i - \hat{C}_i)^2 \\
& + \sum_{i=0}^{S^2} \mathbb{1}_i^{\text{obj}} \sum_{c \in \text{classes}} (p_i(c) - \hat{p}_i(c))^2
\end{aligned}$$