Object Recognition in AI

1. How many bytes is a 1080x1920 image with color, assuming no compression? Hint: Each pixel has 3 colors (RGB), and each color is one byte.  
     
   Ans. Image has 1080x1920x3=6,220,800 bytes(6.22MB approx)
2. How many trainable parameters did the first convolutional neural network have (i.e. how many values did you try to change)?

Ans. Trainable parameters here is kernel weights and bias.

Total trainable parameters are 3x3x3(kernel weights)+ bias = 27+1=28

I changed 3+3+3= 9 parameters in kernel

1. What is the 4-letter word for error that a neural network tries to minimize?

Ans. Loss

1. In 1-2 sentences, describe how a typical neural network model's error changes as the it is being trained.

Ans. As a neural network is trained, its error (loss) typically decreases over time as the model learns to make better predictions by adjusting its weights through backpropagation and optimization. However, if training continues for too long or the model overfits, the error on the validation set may start increasing, indicating poor generalization.

1. About how long did it take for you to annotate the 6 images? At that rate, how long would it take to annotate 1000 images?

Ans. I’m using <https://agr333.netlify.app/> for annotating the images. For 6 images it took 3-4 minutes. At that rate it will take 11-12 hours to annotate 1000 images.

1. For the neural network where you chose the layers:  
   3a. How many layers did you use?

Ans. 3 layers.

3b. How many trainable parameters did the model have?

Ans. 5377

3c. How many epochs did you train it for?  
 Ans. 150

3d. what was the train loss?  
Ans. 0.5371471988107626  
3e. what was the validation loss?  
Ans. 1.4413816102142338

1. For the very last neural network you trained (the U-Net one):  
   3a. How many trainable parameters did the model have?  
   Ans. 18312809
2. 3b. what was the train loss?  
   Ans. train loss 0.21979376084675653
3. 3c. what was the validation loss?  
   Ans. val loss: 0.3585424249927395