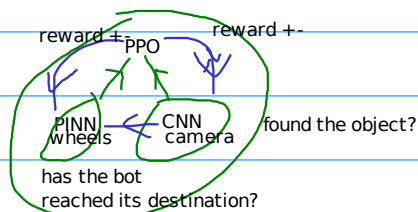
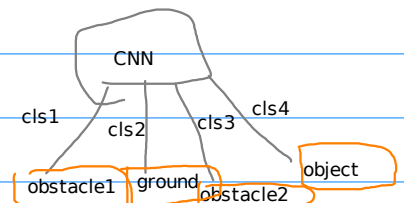


CNN sidetrack :=  
find an object that is available in simulation  
and we would have a pretrained model on  
the object image...this model parameters  
would be loaded and ready to be used with bot,  
and as turtlebot is navigating the env,  
using LIDAR, the camera is open, it parses  
frames, once we find frame of the target object,  
using CNN model, then we stop sim.

agent learning modular architecture

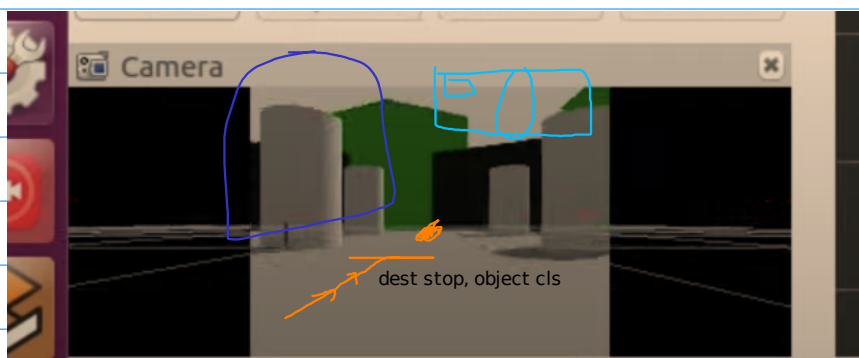


multiclass like MNIST dataset (#s)



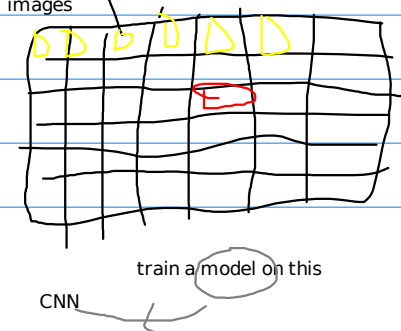
classifying the object and destination are the two goals..

take images as in 'frames' from the current position



YOLO

images



parse individual frames or record video and just get individual frames from there

#### **Progress Report 1**

1. Define a valid environment (2 different obstacles, a target object, ground) in Gazebo; realistic to real world application env
2. Run a simulation with turtlebot that has camera, imu, lidar and parse frames from camera, that would make our dataset (or we can look online)
3. Preprocess these images by labeling them, using YOLO. Thus, we would then have raw dataset, and labeled dataset.

#### **Progress Report 2**

4. Train a CNN model on these labeled images, creating a multiclassification model (ground, obstacle1, obstacle2, target object). Make the model ready to be used for turtlebot simulation when importing the model.
- CNN: <https://www.kaggle.com/code/ahmadjaved097/multiclass-image-classification-using-cnn>

#### **Progress Report 3**

5. Integrate PINN, PPO, CNN altogether.

#### **Progress Report 4**

6. Finished project with target object detected, destination is reached.