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EECE 371 Assignment 4

1. Collect Data:
   1. What data will our system need to learn?
      1. Typical household furniture: couches, chairs, coffee tables, beds, etc.
   2. Is there a dataset ready to use?
      1. Yes: Imagenet, COCO, CIFAR100
2. Feature Selection:
   1. Features
   2. Which features do we plan to extract?
      1. Basic shapes of furniture to identify between something like a couch and an entertainment center
      2. Location of the classified objects, to determine how to adjust its pathing
3. Which Neural Network algorithm or techniques that will work best:
   1. A convolutional neural network will work best for extracting features such as classifications and locations of objects. For the classifier training, we will provide a convolutional neural network trained on images and labels for each image. For the locations we will also train by inputting images, but the output will be a regression predicting one of the corners of a bounding box and the height and width of the box. The bounding box will hopefully completely encompass the object in the image so we can then determine how to move the car according to the object’s location.
4. Model and parameters of this model:
   1. For our model SqueezeNet may be a good choice due to it’s small memory requirements with AlexNet level accuracy. We would need to retrain the network on our own dataset composed of furniture and people. One issue that may arise is getting a network to create the bounding boxes around the object. Neither of us have experience training a network to do that task, but it would be an interesting challenge.