Machine Learning II

Group - 8 (Richa, Priyanka, Hninn)

Project proposal

The purpose of the proposal is to describe the final project in Deep Learning about image classification using Google AI open images dataset. This sounds interesting because image classification is a central task of computer vision with applications ranging from robotics, self-driving cars and many others. As it is one of the most prominent fields in deep learning, we have selected image classification to do for our project.

We are choosing Google AI open images dataset for our project because the dataset is designed to spur image classification and object detection. But we are only doing image classification in this project. As the dataset is too big to deal with, we are using portion of it for our analysis. It is a large scale object detection, segmentation and captioning dataset. It has 516 objects categories. The dataset consists of natural images, the images that reflect everyday scene and provides contextual information. In an image multiple objects can be found, and each should be labeled as a different object and segmented properly. The dataset provides the labeling and segmentation of the objects in the images. We can take use the labeled and segmented images to create a better performing objection detection model.

We are planning to use Convolutional Neural Network, as CNN is not only for classification, but can also be used for detecting the images. We are working with images, so CNN can shows great results. It has proven very effective in areas such as image recognition and classification. In convolutional network, nonlinearities are represented by convolutional and pooling layers, which are capable of capturing the characteristic features of images precisely.

We are planning to use pytorch or Tensorflow and Keras to implement the network because it has highly flexible system architecture especially for object detection. It also includes faster CNN that we plan to use in our project.

To judge the performance of the network we will be analyzing different aspects of the model by checking the loss. Loss value can tell us how well the network performs on training and testing sets. Another metric to judge the performance is accuracy. We can use accuracy to evaluate how accurate our network performance.

For our reference we will be using certain articles about object detection to know about best framework for our project and also about the evaluation metrics.

Schedule

Task 1: Working on Dataset- Oct 31st - Nov 3rd

Task 2: Working on resources to do our project (Cloud)- Nov 4th - Nov 7th

Task 3: Trying to understand the most suitable framework for this project- Nov 7th - Nov 14th

Task 4: Building the Network Architecture- Nov 15th - Nov 21st

Task 5: Building the model and evaluating it- Nov 22nd - Nov 26th

Task 6: Trying with different architecture and comparing the results- Nov 27th - Nov 29th

Task 7: Testing the model on real images- Nov 30th - Dec 2nd

Task 8: Preparing report and and presentation- Dec 2nd - Dec 4th

References

- Alphonsa, L., & Resmi, R. (2016). Performance metrics comparison of various image segmentation methods. 2016 International Conference on Control, Instrumentation, Communication and Computational Technologies (ICCICCT). doi:10.1109/iccicct.2016.7987984
- Retrieved from https://www.kaggle.com/c/google-ai-open-images-object-detection-track/data