Robotic Inference

Hytham Tag

Abstract—This project uses NVIDIA DIGITS to classify images using various techniques and data sets for the first data set it classifies objects into several classes candy boxes, bottles and others using google net for training, The second data set it classifies pets into several classes dogs, cats and birds using AlexNet for training.

Index Terms—Robot, IEEEtran, Udacity, LaTeX, deep learning.

---◆---

1 INTRODUCTION

THE objective was to apply classification on two models one with provided data set from udacity and other one i searched the internet and got my own data for each class.

1.1 First task

First task is to identify bottles, candy boxes and others which can be used in recycle factories with 75% accuracy and under 5 ms.
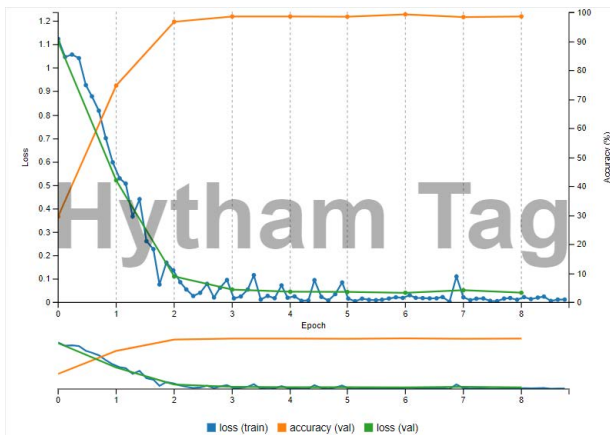

Fig. 1. First task.

1.2 Second task

Second task is to classify pets into several classes dogs, cats and birds with accuracy over 80%.

2 BACKGROUND / FORMULATION

2.1 First task

I used the dataset that was supplied from udacity and applied google net under 10 epochs and 0.001 learning rate with accuracy almost 100% under training and achieved 75.4% accuracy under validating with time under 5 ms.

2.2 Second task

I used many datasets from the internet and applied Alex net under 30 epochs and 0.001 learning rate with accuracy of nearly 80.878% under training and achieved 75% accuracy under vali-dating with time under 5 ms.
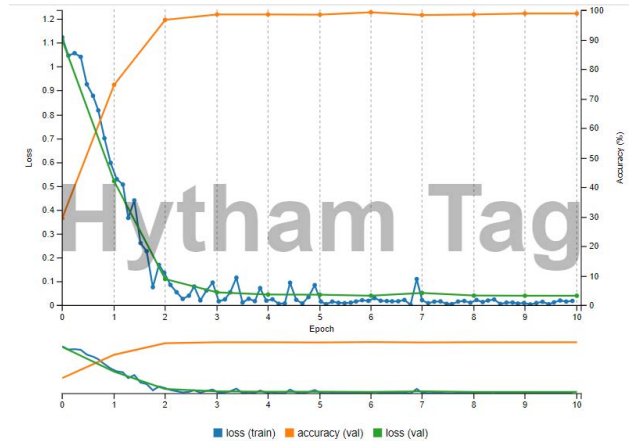

Fig. 2. Second task.

3 DATA ACQUISITION

3.1 First task

I acquired the data from udacity Digits lab which contains 3 labels candy boxes, Bottles and nothing.

Fig. 3. Bottles.

3.2 Second task

I acquired the data from several source from the internet which contains dogs, cats and birds.
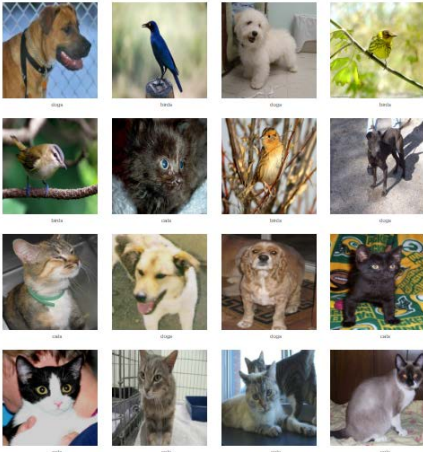
Fig. 4. Dogs Cats & Birds.

4 RESULTS

4.1 First task

The result after 10 epochs was 100% accuracy after testing and 75.4% after validating and detection was under 5 ms

Fig. 5. First task.

4.2 Second task

The result after 30 epochs was 80.878% accuracy after testing and i tried different picture and the result varied from 76 to 90
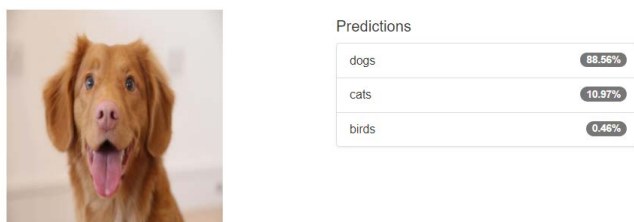

Fig. 6. Second task.

5 DISCUSSION

For me both model have different parameter for first task i want to increase the time over the accuracy cause if it was implemented in a recycling factory speed would be a must but in second task the time in this case can be dropped for better recognition.

6 CONCLUSION / FUTURE WORK

6.1 First task

Next step is to re-categorize the labels to classify the materials (Papers-metal-Plastic) and classify more objects that must be discarded from the recycle process.

6.2 Second task

Next step is to re-categorize the labels to classify more pets and the breeds of the pets.