International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

APPLICATION OF DEEP LEARNING IN OBJECT DETECTION

[1]Ch Satyanarayana[2]Latika Lakshmi Sravani, [3]Kethireddy Swarnalatha, [4]Akula Sai Pavan
[5]Kothuri Naga Sai Kiran
[1,2,3,4,,5]Assistant professors, Department of CSE in Narasaraopet Institute Of Technology

ABSTRACT

Deep Learning Neural Networks have been commonly used in the field of object recognition. This draft interim report intends to give a detailed overview on the project "Object Recognition by Deep Learning Neural Networks". The ultimate objectives of this project are to: 1) reproduce CNN on Python; and 2) replace original classifier with Latent Dirichlet Allocation classifier to improve accuracy. In order to achieve the goal, project team will utilize public datasets to train and evaluate the algorithm. At current stage, version CNN has been implemented with and selective search has been reproduced in Python version CNN. No particular difficulties were encountered at this stage since the project is still in the early phase. It is expected that ultimate deliverable will be able to achieve higher accuracy rate than Python implemented CNN. Visual object detection is a popular computer vision task that has been intensively investigated using deep learning on real data. However, data from virtual environments have not received the same attention. A virtual environment enables generating data for locations that are not easily reachable for data collection, e.g., aerial environments. In this thesis, we study the problem of object detection in virtual environments, more specifically an aerial virtual environment. We use a simulator, to generate a synthetic data set of 16 different types of vehicles captured from an airplane. To study the performance of existing methods in virtual environments, we train and evaluate two state-of-the-art detectors on the generated data set. Experiments show that both detectors, You Only Look Once version 3 (YOLOv3) and Single Shot Multibox Detector (SSD), reach similar performance quality as previously presented in the literature on real data sets. In addition, we investigate different fusion techniques between detectors which were trained on two different subsets of the dataset, in this case a subset which has cars with fixed colors and a dataset which has cars with varying colors. Experiments show that it is possible to train multiple instances of the detector on different subsets of the data set, and combine these detectors in order to boost the performance.

1. INTRODUCTION

The area of Artificial Intelligence and Digital Image Processing is development in the world in drastically. Many areas of industry have started using the various techniques and applications of AI with deep learning. The project can be implemented for marketing and enhancement change to new thing innovation purpose also, let us know the feedback of any product development the products. It provides accurate perfect results analysis. As well as are easy to be implemented and understood in the most common systems, the features can be installed in a cost helpful and efficient approach in schools or colleges or any other area to surveillance is required, but lack of finances is a most important factor to trouble to development AI. The project, surveillance could be provided which results help in maintaining a regular health check and to identify the emotion of a person at employment place. It can also be used as criticism of personnel after production a quantity of change at work place.

Convolutional neural networks (CNNs) have been widely used in visual recognition from due to its high capability in correctly classifying images. In the authors show an

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

extremely improvement on the accuracy of image classification in Image Net Large Scale Visual Recognition Challenge (ILSVRC). And CNNs become the most preferable choice for solving image classification challenges. Besides image classification, researchers have extended the application of CNNs to several other tasks in visual recognition such as localization, segmentation, generating sentences from image as well as object detection. In our project, we mainly focus on the task of object detection which has tremendous application in our daily life. The goal of object detection is recognized multiple objects in a single image, not only to return the confidence of the class for each object, but also predict the corresponding bounding boxes. Among most of the works in object detection, region CNNs (CNN) is the most remarkable one that combines selective search, CNNs, support vector machines (SVM) and bounding box regression together to provide a high performance in object detection. In this paper, we will provide an alternative approach of object detection by reducing the complexity of the CNN. First, we adopt edge box, a recent published algorithm to generate region proposals, instead of selective search used in CNN. Shows that even though the mean average precision between edge boxes and selective search are almost the same, edge boxes run much faster than selective

2. LITERATURE SURVEY

Literature survey is the most important step in software development process. Before developing the tool, it is necessary to determine the time factor, economy n company strength. Once these things r satisfied, ten next steps are to determine which operating system and language can be used for developing the tool. Once the programmers start building the tool the programmers need lot of external support. This support can be obtained from senior programmers, from book or from websites. Before building the system, the above consideration are taken into account for developing the proposed system.

1. Krizhevsky, I. Sutskever, and G. Hinton. ImageNet classification with deep convolutional neural person 0.889 horse 0.146 networks. In NIPS, 2012.

Trained a large, deep convolutional neural network to classify the 1.3 million high-resolution images in the LSVRC-2010 ImageNet training set into the 1000 different classes. On the test data, we achieved top-1 and top-5 error rates of 39.7\% and 18.9\% which is considerably better than the previous state-of-the-art results. The neural network, which has 60 million parameters and 500,000 neurons, consists of five convolutional layers, some of which are followed by max-pooling layers, and two globally connected layers with a final 1000-way SoftMax. To make training faster, we used non- saturating neurons and a very efficient GPU implementation of convolutional nets. To reduce overfitting in the globally connected layers we employed a new regularization method that proved to be very effective.

3. System analysis

3.1 Existing System

The existing system has unable to find out the facial expression. It's not supporting the machine learning (ML), artificial intelligence (AI).here database only capturing the data only management the data base. The existing system to totally failures the capturing Images to identifying the facial emotion expression.

Disadvantages

- No accurate results
- Not possible to find the facial expression.
- Loss the data base.

3.2 Proposed System

The proposed system in which there is a thought for an better object recognition technique which is based on the region of interesting to let the convolution neutral networks (CNN) focus only on those areas

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

which are associated with that particular object which the human face makes. The given training data, it also identifies the relationship between the different areas which are helpful in intensifying the accuracy, thereby making it reliable of the predicted targets. In test stage, we investigated recognition. Identify the test image directly; implemented decision fusion strategy on areas. Object demonization of are natural identify the that people tend to make naturally, instead of any conscious effort that is accompanied by the refluxing of nature item to identify the object. Some of the common objects can make according to the different situations one may find itself in. This is a proposed method to find the identify and recognize the object.

Advantages

- Time saving
- Find the object
- Accurate results

Hardware Requirements:

➢ RAM : 4GB and Higher
➢ Processor : Intel i3 and above
➢ Hard Disk : 250GB

Software Requirements:

➢ OS : Windows10
➢ Python IDE : Python 3.X and above
➢ IDE : PycharmIDE,Anaconda
➢ Camera : 720Pixl Digital Camera(USB or lap camera)

4. INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

➢ What data should be given as input?
➢ How the data should be arranged or coded?
➢ The dialog to guide the operating personnel in providing input.
➢ Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

1. Input Design is the process of converting a user-oriented description of the input into a computer- based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.
2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.
3. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as

when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal
www.ijarst.in
ISSN: 2457-0362

design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.
2. Select methods for presenting information.
3. Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

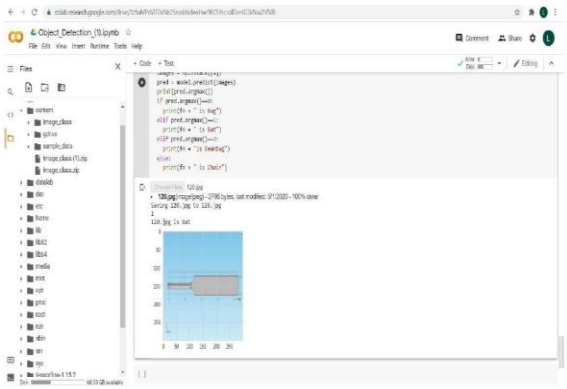
❖ Convey information about past activities, current status or projections of the

❖ Future.

❖ Signal important events, opportunities, problems, or warnings.

❖ Trigger an action.

5. Results:



6. Conclusion

Overall in this project, we have learned hands on experience in working with CNN such as debugging network, transfer learning and working model. We also adopt the CNNs to solve the detection problem and try to improve the exist model such as CNN. In this paper, we provide a new model for object detection based on CNN. In this model, we use the edge boxes algorithm to generate proposals, and use a fine-tuned the model to generate the score for each proposals.

Our model achieves the VOC 2007 dataset. To further improve this model beyond the scope of this project, we will use all the proposals generated from the edge boxes rather than throw the tiny proposals as we do in this paper. Furthermore, we will change a more deeper network to increase the accuracy of classification as well as to add the ground truth bounding boxes into the training data to improve the localization accuracy.

A few open suggestions for future work is to conduct, in the same virtual environment, additional experiments for different state-of-the-art detectors, for example, how the detector's performances are affected by adding blurring to the testing images, or if an increase in detector resolution would increase the performance. Or for example how much can the angle at test time differ from angles used during training before performance degrades. A final interesting question not investigated in this thesis is how to transfer or adapt the detectors for the real world, one example is the process of creating more photo- realistic images. Generative adversarial networks present an interesting option in the field of image generation.

REFERENCES

1. A. Krizhevsky, I. Sutskever, and G. Hinton. ImageNet classification with deep convolutional neural person 0.889 horse 0.146 networks. In NIPS, 2012. 1, 3, 4, 7

2. C. Szegedy, A. Toshev, and D. Erhan. Deep neural networks for object detection. In NIPS, 2013. 2

3. L. Jonathan, S. Evan, D. Trevor, Fully convolutional networks for semantic segmentation, to appear in CVPR 2015.

4. K. Andrej, Li Fei-Fei, Deep visual-semantic alignments for generating image descriptions. 7 arXiv:1412.2306.

5. R. Girshick, J. Donahue, T. Darrell, and J. Malik. Rich feature hierarchies for accurate object detection and semantic segmentation. in Proc. CVPR, 2014.

6. J. Uijlings, K. van de Sande, T. Gevers, and A. Smeulders, Selective search for object recognition. in Proc. IJCV, 2013.

7. C. Lawrence Zitnick and Piotr Dollar, Edge Boxes: Locating Object Proposals from Edges. in ECCV 2014.

8. H. Jan, B. Rodrigo, S. Bernt How good are detection proposals, really? arXiv:1406.6962

9. D. Lowe. Distinctive image features from scaleinvariant keypoints. IJCV, 2004.

10. N. Dalal and B. Triggs. Histograms of oriented gradients for human detection. In CVPR, 2005.

11. M. Tomasz, G. Abhinav and E. Alexei. Ensemble of exemplar-SVMs for object detection and beyond. in Proc. ICCV 2011.

12. P. Felzenszwalb, R. Girshick, D. McAllester, and D. Ramanan. Object detection