

Object Detection Application: For children's better understanding and also for study while having fun

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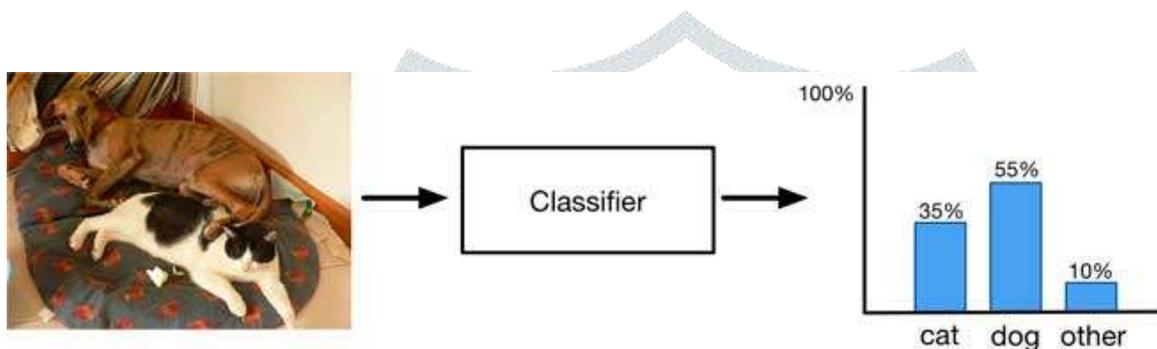
Abstract

As we have seen that mostly for teaching a small kid the basic things that he/she should know before going to school is through books only which a kid mug up and don't understand it and even if a child sees those things around them they might not recognize them. The child may get bored and may not find this way of learning interesting as during that age children are more inclined towards playing and with the help of this application it will provide the children such experience that they will like to click the photos around them and learn things about that object. They will like to click photos when they go to eat vegetable market and may click photos and known the name of the particular vegetable.

Also, sometimes children might mug up spelling and they might recognize the image of that object but in reality when such object comes in front of them they find it hard to recognize the object because some objects appear very different in reality from what they look in an image which is a real problem.

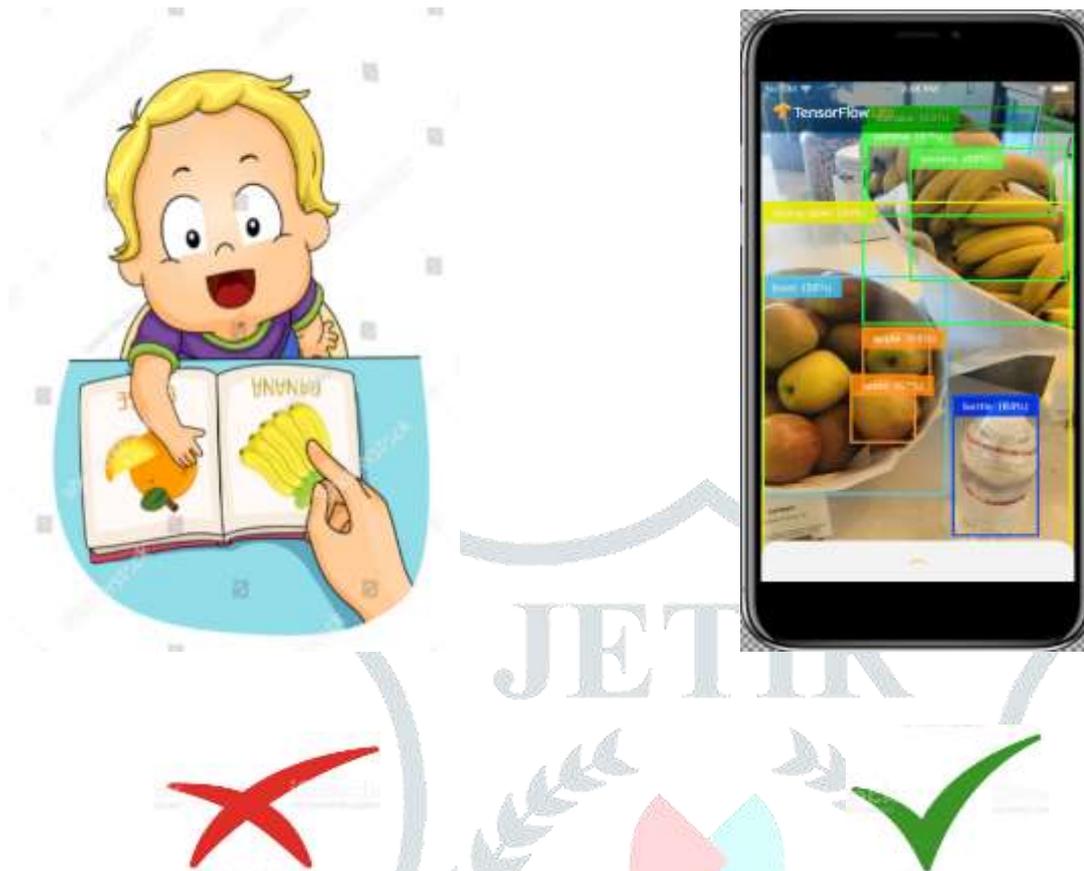
Introduction-Object Detection Application is the application that is based on the concept of Deep Learning(DL). As the advancement in the DL is increasing day by day with the help of these advancements we can create more complex and interesting model that will be helpful in our day to day life and help us grow with the flow. As, we can see nowadays people are using mobile phones very much and their needs for the same has increased very much. From the simple calling functionality with which the mobile phones are introduced to now with extended functionality of payment, camera, maps ,social networking websites, etc. Mobile phones had come a long way. One of the new technologies that is also introduced is object detection using ML algorithms. Machine Learning algorithms works on two basic concepts that are the Training Phase and the Inference Phase. In the Training phase our model, neural network(in regards to our project) is trained to behave in our a certain way based on given dataset. This step can be easily carried out in cloud and then distributed to the various devices, where the trained model is inference on previously unknown data. With the help of this application we are able to detect basic objects around us, like table, chair, animals, flowers, television, pen, books, vehicles, etc.

Existing System- The existing applications that are related to object detection system has been confined to their detection only. They are not much interactive and do not specifically define the object that is being detected like our Object Detection Application that is especially for small children who are in play way or yet not started going to schools. Our application will define the name of the object and few uses, definition, or color of the object that is detected, so that it will help the child to learn more things interactively. The applications that are already using the object detection technology are embedded in other application but our application have only one sole purpose that it will detect and display the information of the object that is being detected in the image that is clicked by the child.



Proposed System- The existing applications that are related to object detection system has been confined to their detection only. They are not much interactive and do not specifically define the object that is being detected like our Object Detection Application that is especially for small children who are in play way or yet not started going to schools. Our application will define the name of the object and few uses, definition, or color of the object that is detected, so that it will help the child to learn more things interactively. The applications that are already using the object detection technology are embedded in other application but our application have only one sole purpose that it will detect and display the information of the object that is being detected in the image that is clicked by the child. The existing applications that are related to object detection system has been confined to their detection only. They are not much interactive and do not specifically define the object that is being detected like our Object Detection Application that is especially for small children who are in play way or yet not started going to schools. Our application will define the name of the object and few uses, definition, or color of the object that is detected, so that it will help the child to learn more things interactively. The applications that are already using the object detection technology are embedded in other application but our application have only one

sole purpose that it will detect and display the information of the object that is being detected in the image that is clicked by the child.



Advantages-

- a) Overcomes the tendency of children to mug up things.
- b) This system is effective and saves time and cost of the parent who goes to office and gives extra money to the play way schools.
- c) Children will love this application as it will be designed according to them as if it's any game.
- d) Easy to use the application anywhere and anytime.
- e) They will be expose to new things and new ways of learning.

System Design – In our application first thing that would happen is the child will click a photograph using the camera of our application and after that when photo is taken then objects will be detected in it and name of that object will appear on the screen with first letter

highlighted, and also some other names starting from that first letter and few lines about that object.

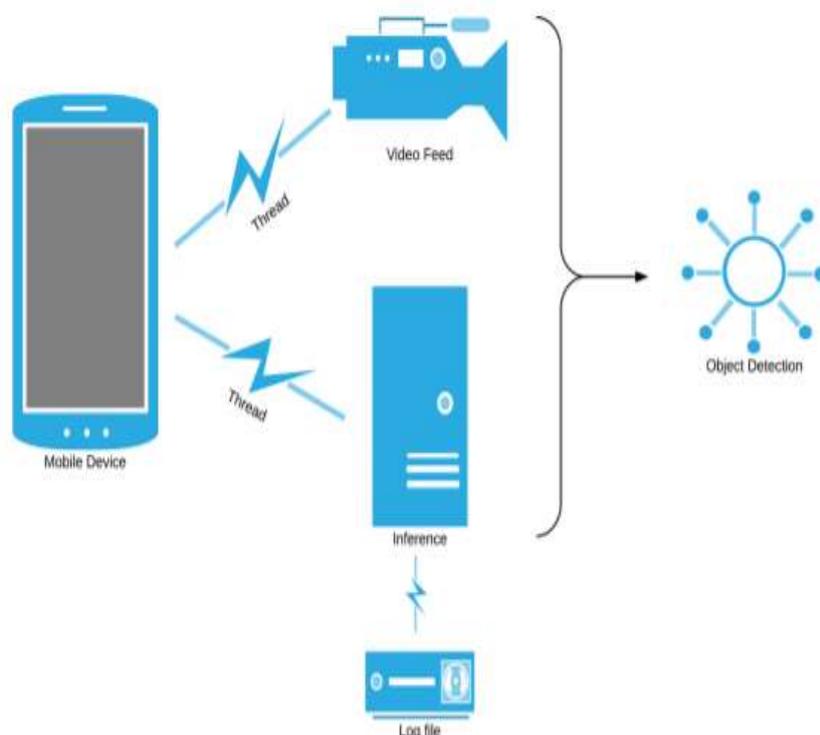
For Object detection we will be using ML algorithm for object detection and classification since here two things are being used that are:

1)- Object Detection

2)- Image Classification

How object detection works:-

- Object recognition is to describe a collection of related computer vision tasks that involve activities like identifying objects in digital photographs.
- Image classification involves activities such as predicting the class of one object in an image.
- Object localization is refers to identifying the location of one or more objects in an image and drawing an abounding box around their extent.
- Object detection does the work of combining these two tasks and localizes and classifies one or more objects in an image
- When a user or practitioner refers to the term “object recognition“, they often mean “object detection“.

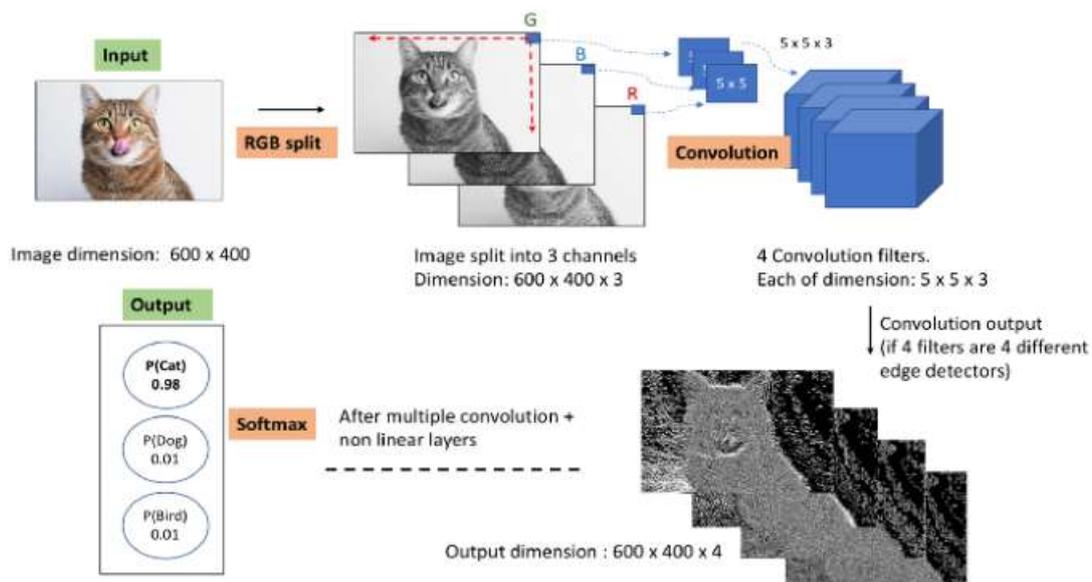


Three main steps of naming an object:

1) Image Classification: This is done by Predict the type or class of an object in an image.

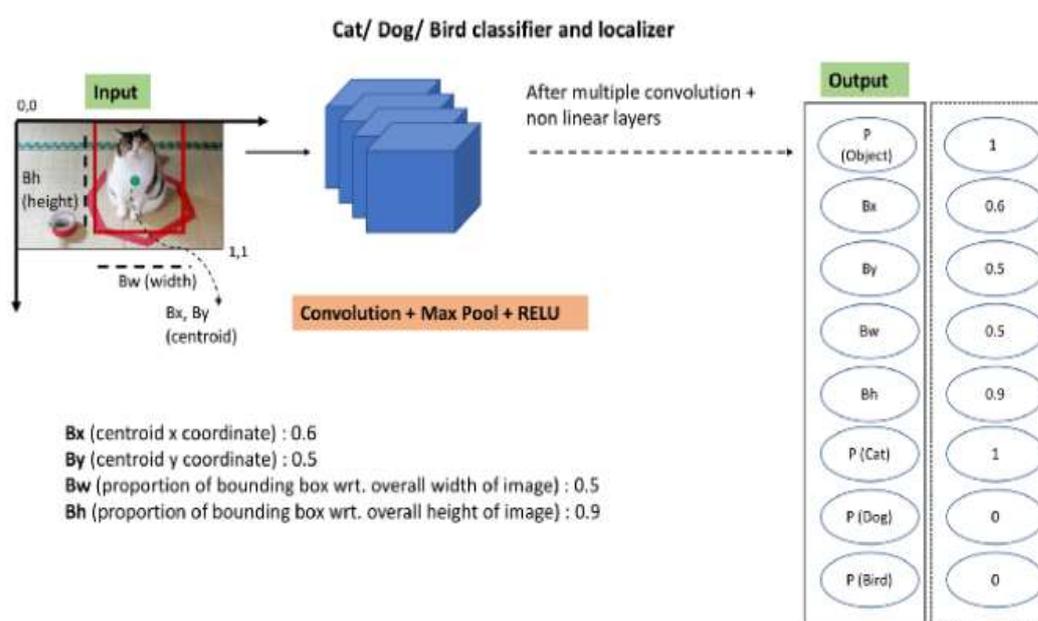
Input: An image which consists of a single object, such as a photograph.

Output: A class label (e.g. one or more integers that are mapped to class labels).



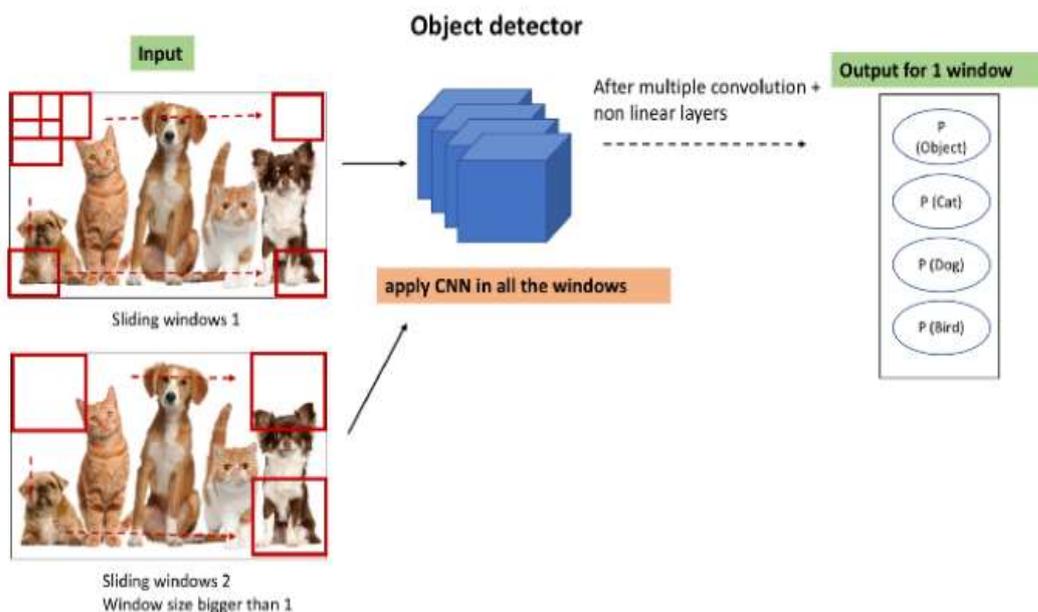
2)- Object localization: This is done through, Locate the presence of objects in an image and indicate their location with a bounding box.

- Input: An image which consists of one or more objects, such as a photograph.
- Output: One or more bounding boxes (e.g. defined by a point, width, and height).



3)- Object Detection: This is done through, Locate the presence of objects with a bounding box and types or classes of the located objects in an image.

- Input: An image which consists of one or more objects, such as a photograph.
- Output: One or more bounding boxes (e.g. defined by a point, width, and height), and a class label for each bounding box.



Conclusion-In this project, we made attempt to effectively introduce the concept of object detection in such a way that will help in learning. We have just extended the current object detection application to the level that it will help in learning. It will give a real life experience to the toddlers.

Later we can extend our application by adding various other features like :-

- 1)- It will be used for detecting colour of an object.
- 2)- we can make this application multilingual.

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