RECOGNIZING TRAFFIC SIGNS USING DEEP LEARNING

KC CHIEFS:

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SUMMARY:-

In Modern Era, automobiles companies are manufacturing automated vehicles, which mainly focuses on safety of people by using the advanced technologies. Main aim of the project is providing awareness on traffic signs through deep learning techniques with more accuracy and improve passengers safety.

. To build this application we are using CNN, Flask, Heroku Cloud Technologies.

USE CASE:-

- Every country has different infrastructure for roads, traffic rules, so it is difficult to understand the traffic signs. When you drive the vehicle in different country we get messed up with the new lanes and traffic signs. Sometimes it may even lead to an accident or property loss.
- What’s the solution to the above issue?

SOLUTION:-

- To overcome this issue we are moving into automated vehicles which gives the description of traffic signs integrated in the vehicle, Instead of taking decisions by ourselves.
- In this model autonomous vehicles interpret these signs and make decisions with more accuracy.

DATA SET:-

Our dataset contains 43 Classes and more than 50,000 images in total

It is a multi class single image classification challenge held at the international joint conference on neural networks 2011.

CNN:-

- This is the best model which will detect patterns in images. In our case if there is a STOP image, then each neuron of CNN method will have the capability of detecting the pattern pixels of image, in the final output if we get STOP as text then we stop the process otherwise we back propagate the process and it resumes.

CNN IMPLEMENTATION:

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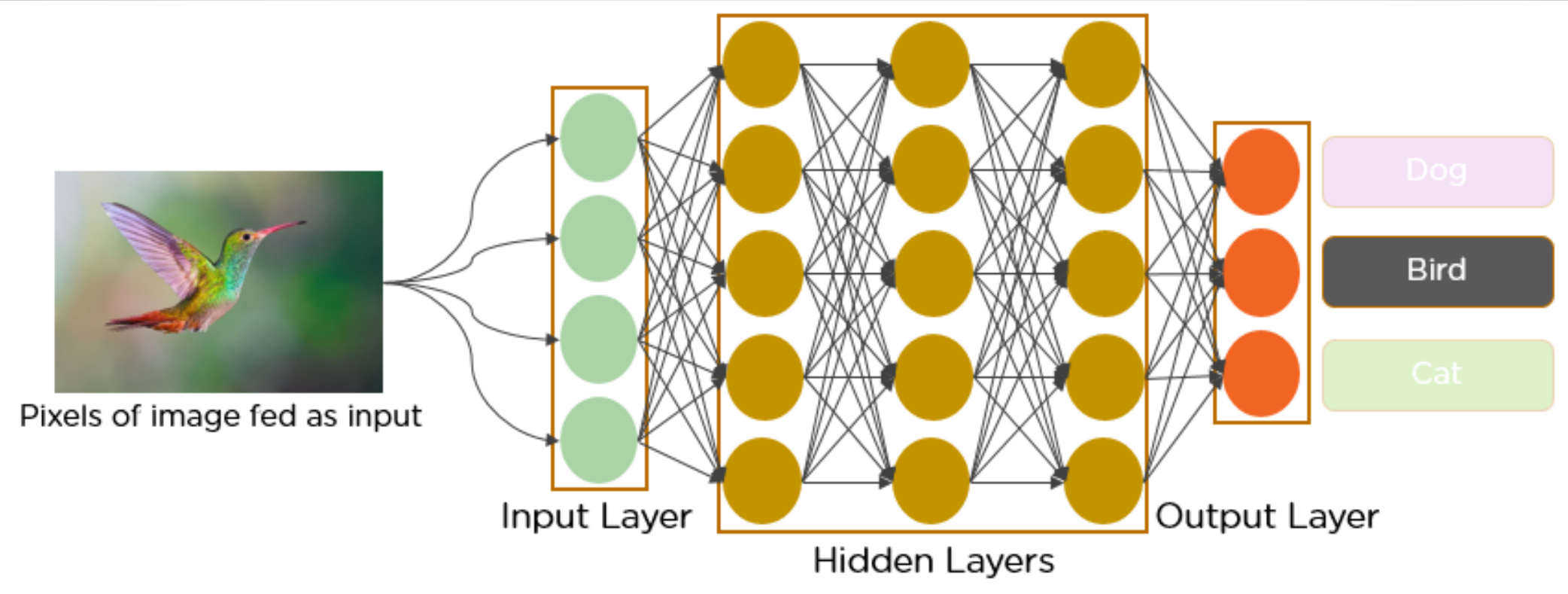
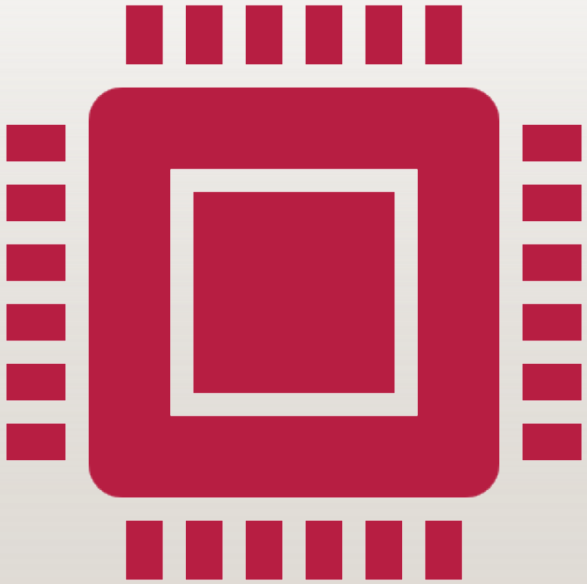


FLASK:-

- It is a framework to build rest API in python. We use this because it is quick and easy to get started and it does not require a particular tool/libraries and we can add third party libraries to build a user interface.



FLASK

To serve the saved model we'll use Flask, a micro web framework written in Python (it's referred to as a "micro" framework because it doesn't require tools or libraries). we need to set a virtual environment in the visual studio code. After that, we need to import all the required libraries.

- To create our web app we need two routes on our Flask app:

1. An index.html page route for the users to upload the image
2. A submit route to make inferences from our saved model.

HEROKU:-

- Sometimes we have to process the large datasets based on our needs. To manage this data we want lot of servers, and it is difficult to manage and maintain in physical servers. So, we opt cloud which helps to scale in & scale out the servers based on our needs.

HEROKU DEPLOYMENT

Heroku lets you deploy, run and manage applications written in Ruby, Node.js, Java, Python, Clojure, Scala, Go and PHP

1)Dependency mechanisms vary across languages: in Ruby you use a Gem file, in Python a requirements.txt, in Node.js a package, In Java a pom.xml.

2)For other applications, you may need to explicitly declare what can be executed. You do this in a text file that accompanies your source code - a Procfile.

3)To deploy your app to Heroku, use the git push command to push the code from your local repository's main branch to your heroku remote.

4)Heroku SSL is a combination of features that enables SSL for all Heroku apps. Heroku SSL uses Server Name Indication (SNI), an extension of the widely supported TLS protocol.

ADVANTAGES:-

- Increase safety of passengers
- We can avoid economical loss
- Reduce traffic congestion

CONCLUSION:-

We can conclude that by implementing this application into the vehicles helps us to recognize the traffic signals & related sign boards in different countries and avoids the confusion and accidents of driver and saves life.

PROJECT SOURCE CODE AND CLOUD DEPLOYMENT

- **GitHub:** https://github.com/NaveenEndeti/Traffic_Signs_DetectionusingCNN

- **Cloud:** https://traffic-signs-cc.herokuapp.com/


THANK YOU