

GAN generated and Hand-drawn Scribble Identification

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Project Outline

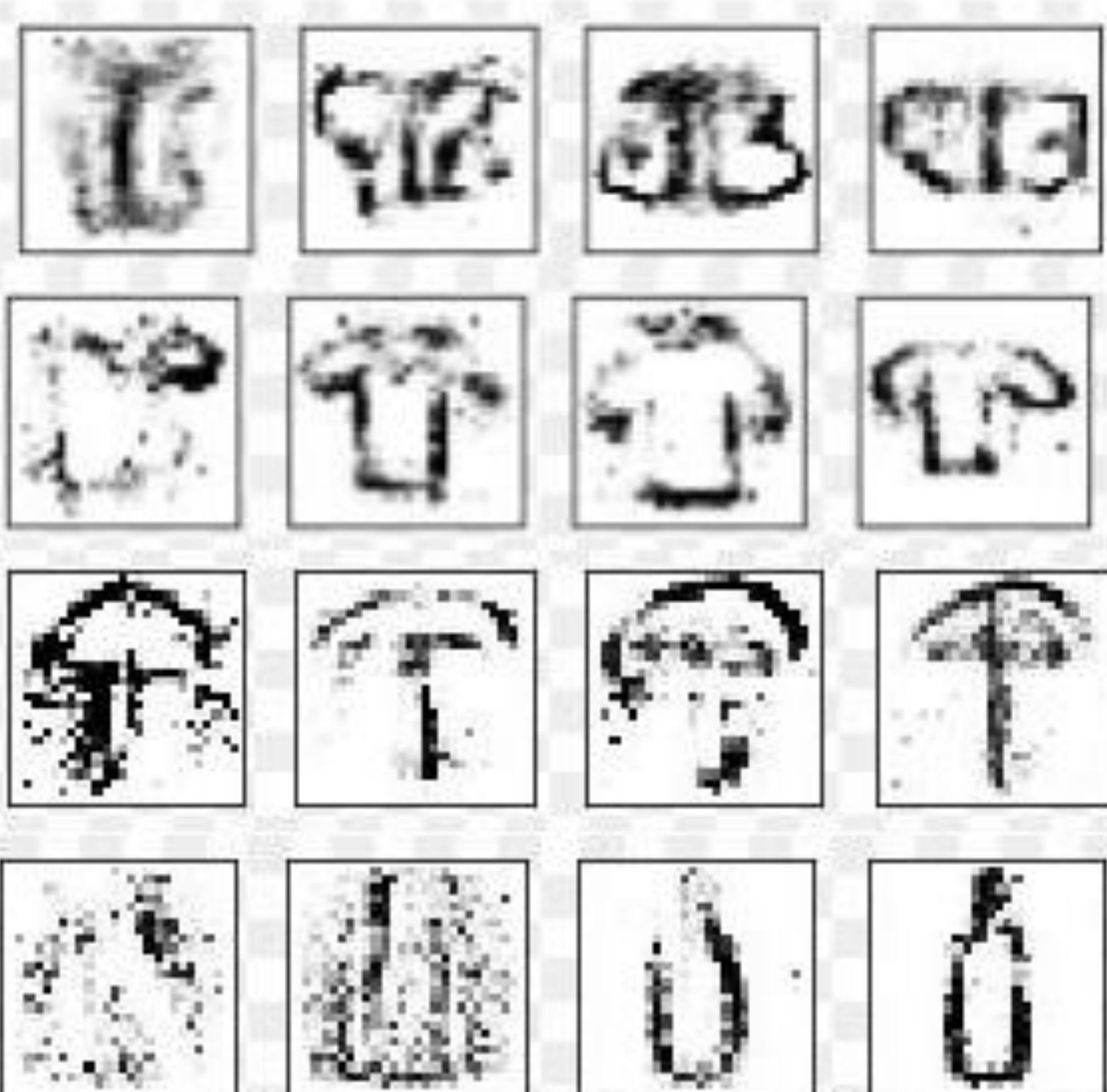
Input: Ask the user to draw a scribble on our Canvas or use one of the GAN generated images.

Model is trained on 7 categories: airplane, banana, butterfly, grapes, t-shirt, umbrella, wine-bottle

Process: The input image is then processed as per the requirement - resize, invert, brighten, flatten. Then either MLP or CNN trained models are used to predict the drawing as per user choice.

Output: The identified category gets displayed along with the pie chart showing predicted probabilities of all categories.

GAN generated samples

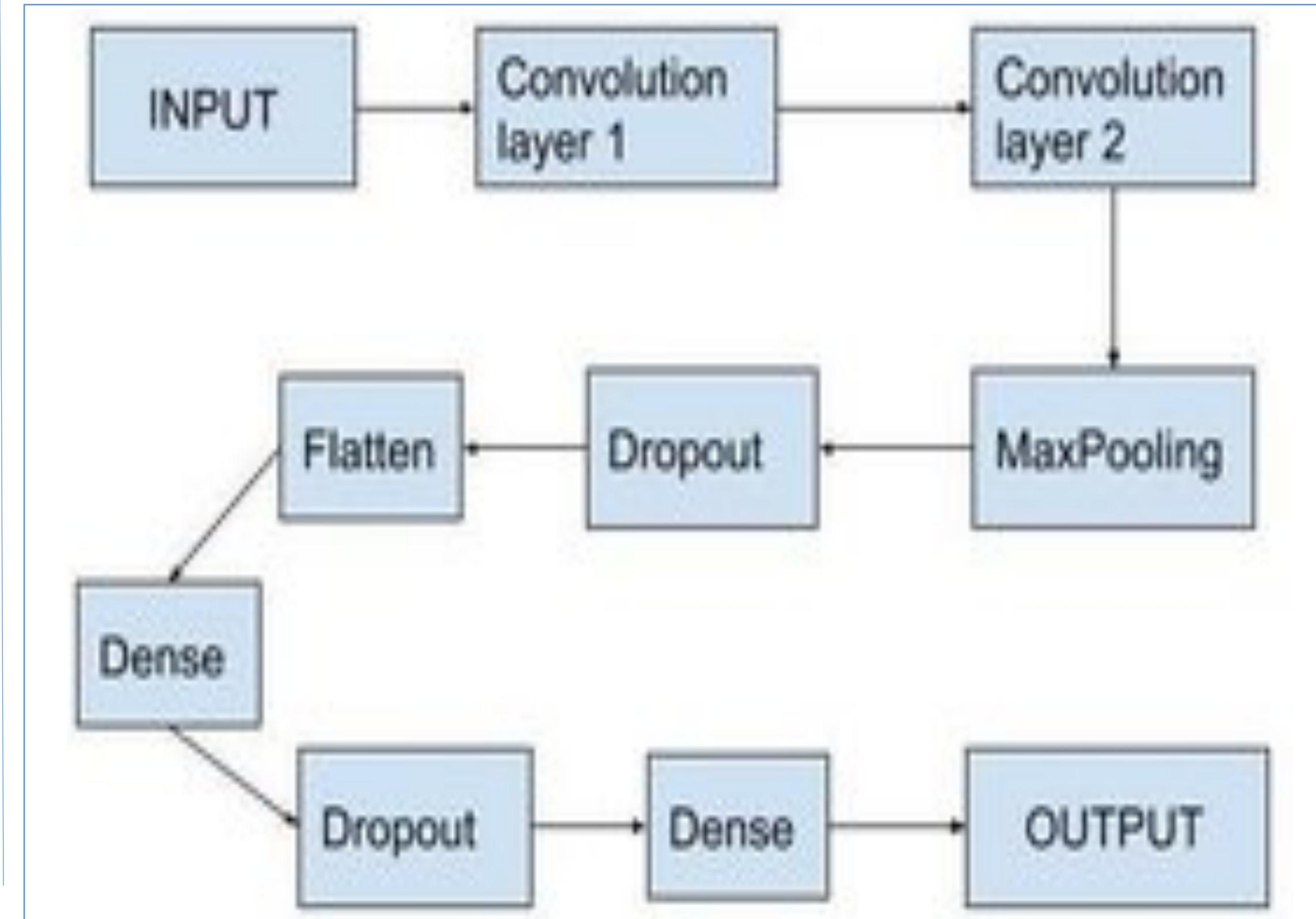


Dataset

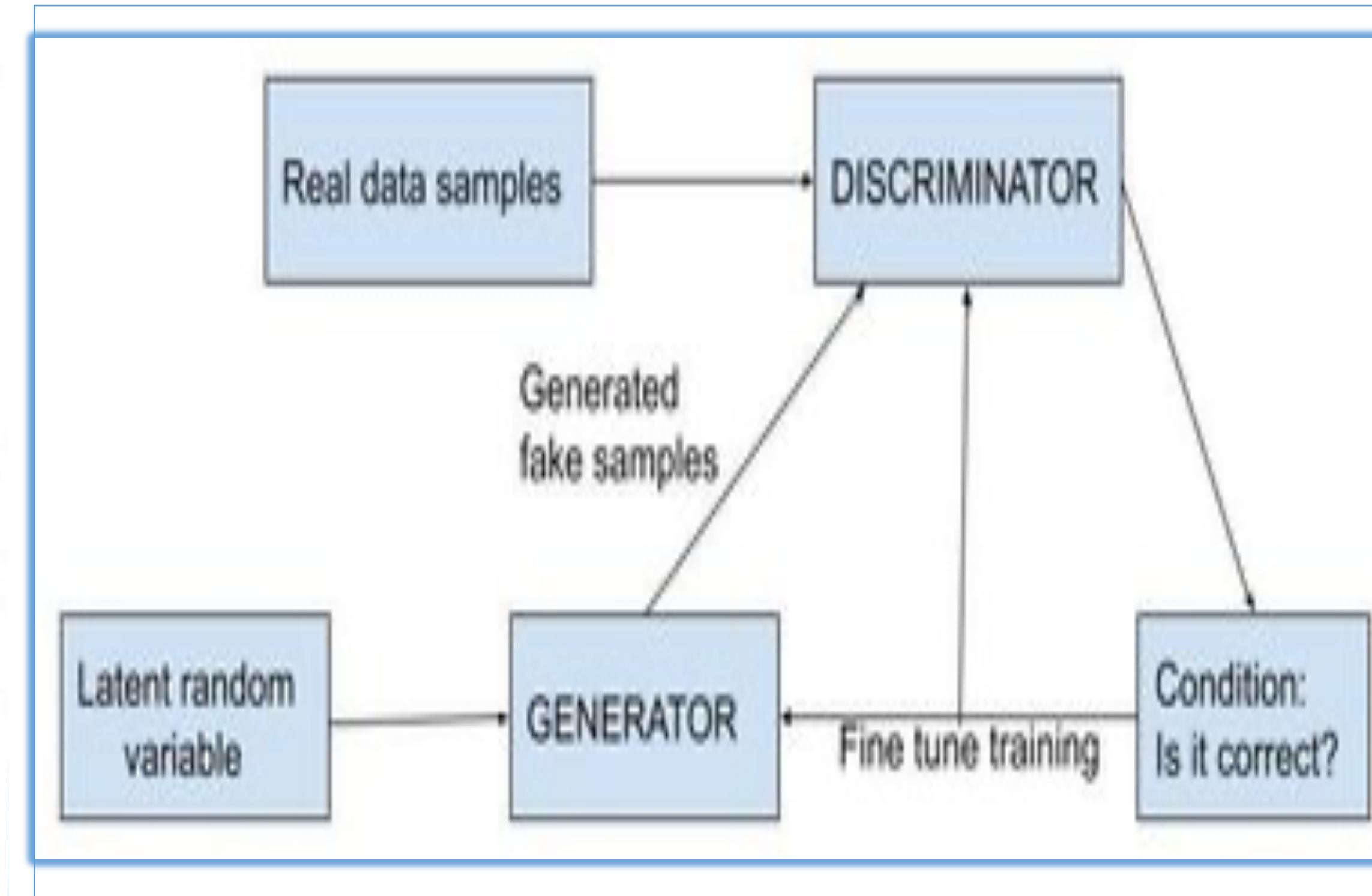
- The model was trained on the 5000 images per object.
- Dataset was split into training(0.80), validation (0.15) and test set (0.05).
- The dataset was obtained from Quickdraw by Google.

Models

CNN



GAN

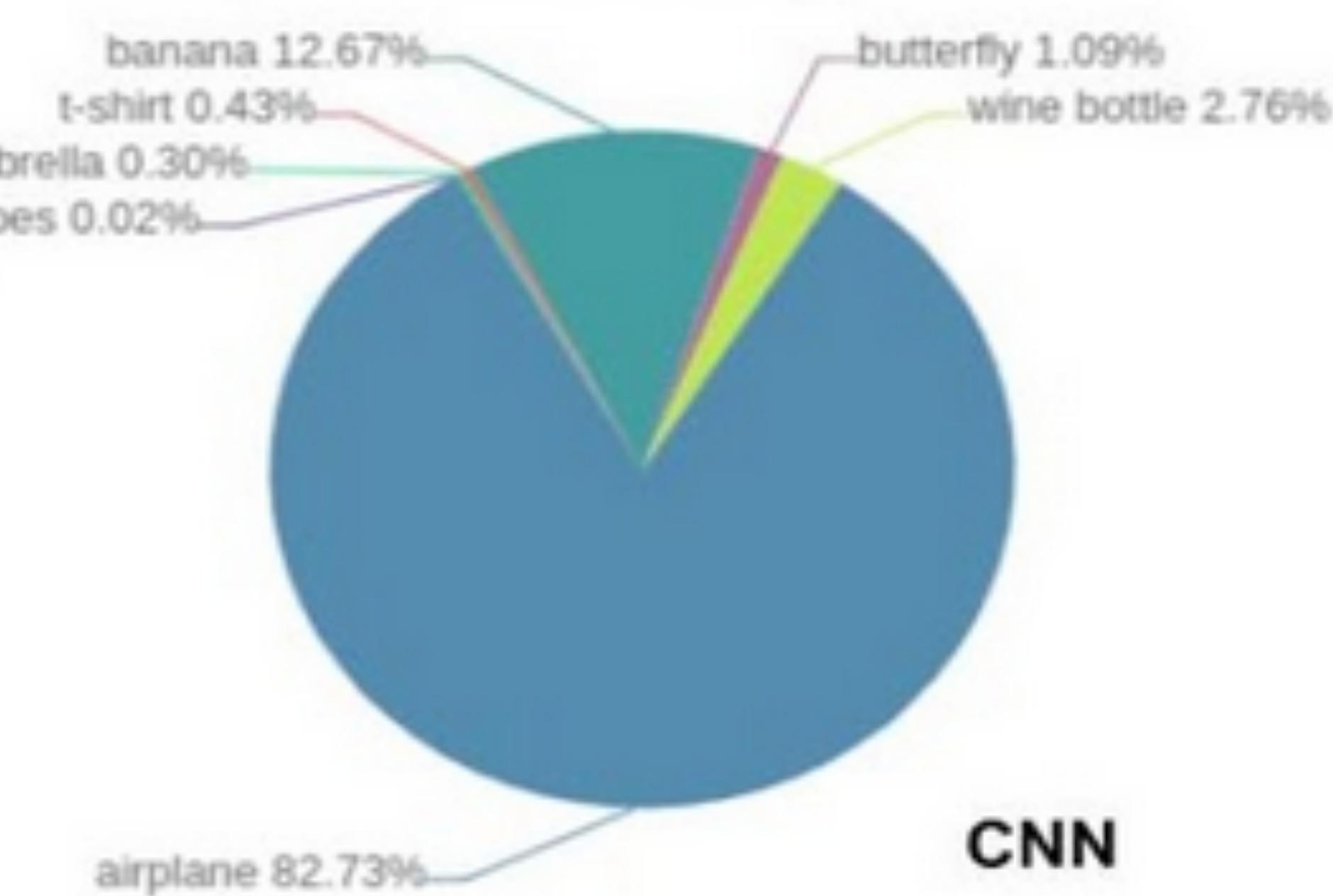


Model Comparison

Model	Parameter	Accuracy
Random Forest	100 trees Max depth = 8	0.79
KNN Classifier	N Neighbors = 5	0.83
MLP	Hidden layers=(,784)	0.87
CNN	No. of filters = 32 → 64	0.93

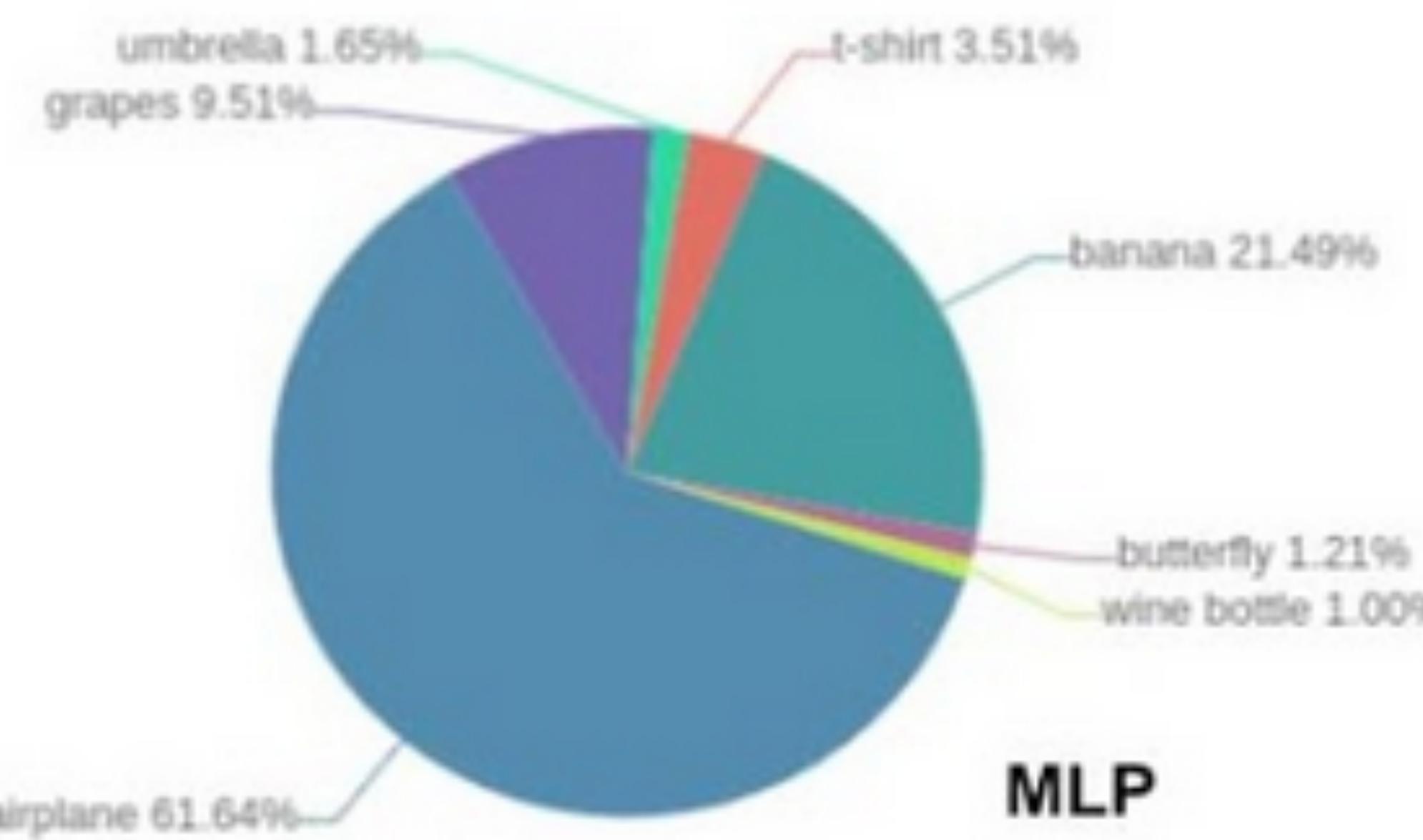
Results

Detected Objects



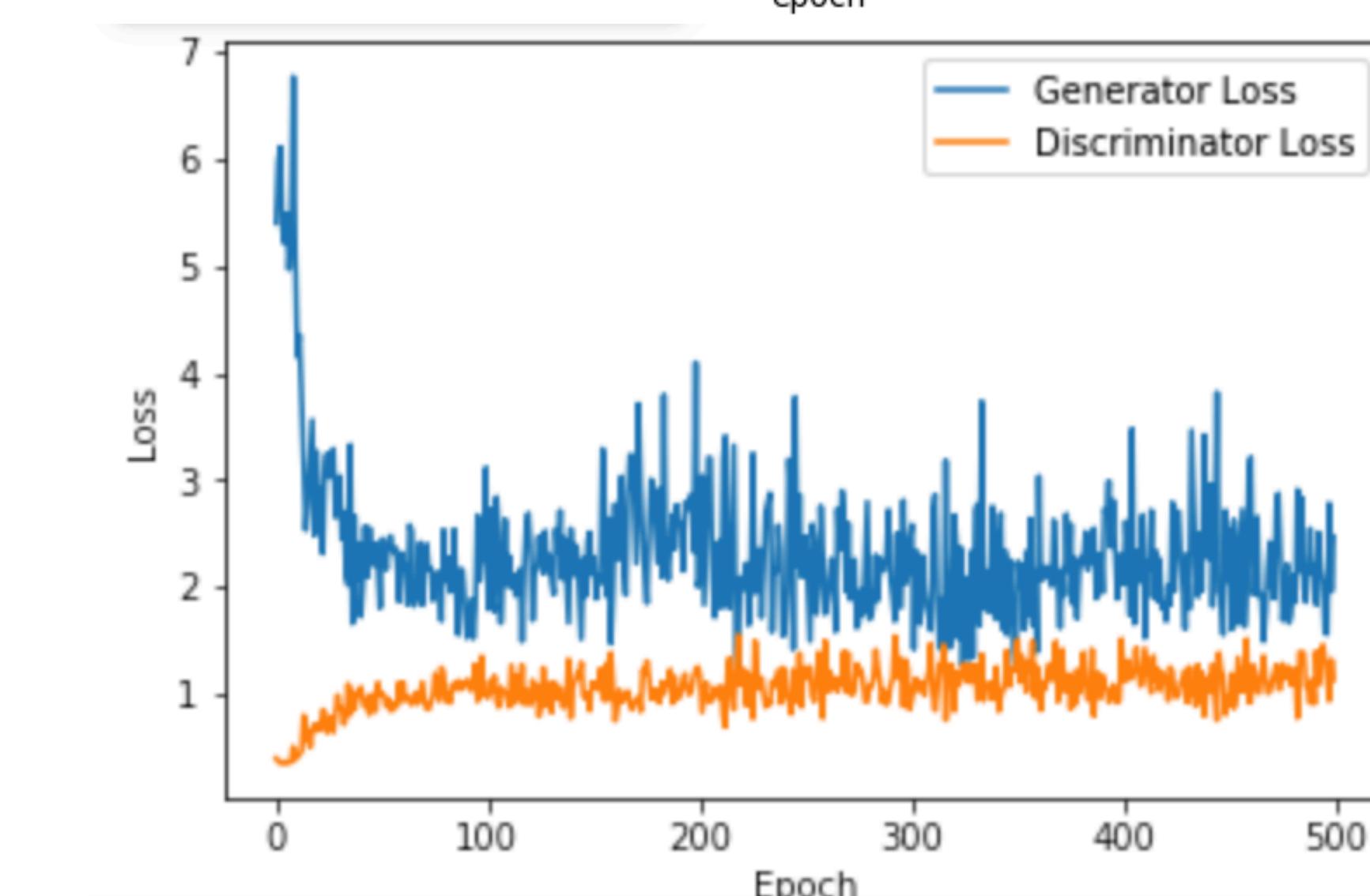
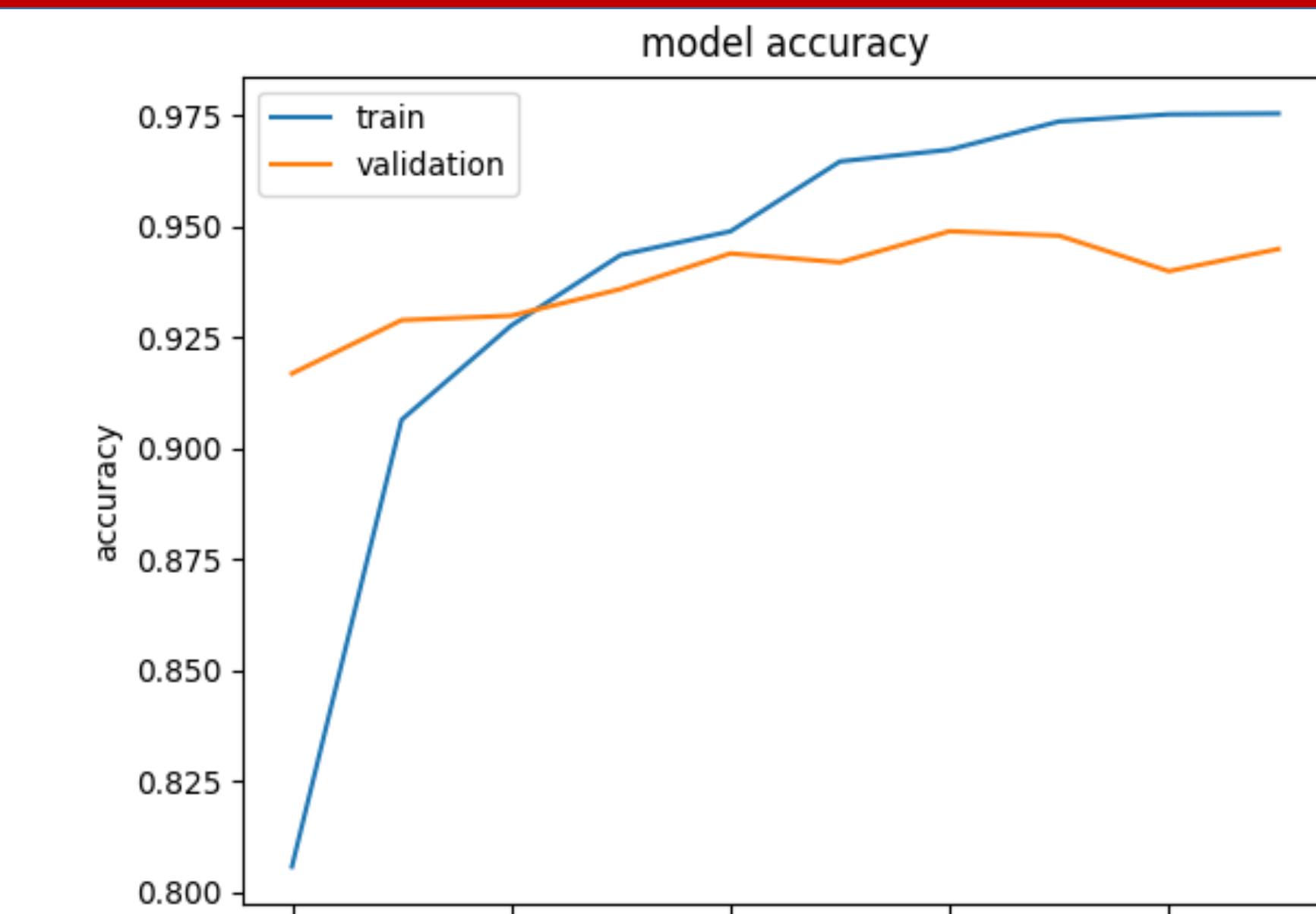
CNN

Detected Objects



MLP

Model Accuracy



Limitations

- Difficult to predict un-oriented images.
- Due to high computational requirement of GAN, model only uses few GAN generated images.

Applications

One of the applications of our project can be a Human to Computer Pictionary game.

Conclusion & Future Work

Out of all the models used, CNN performed the best and the predicted probabilities were quite high. In future, model performance can be evaluated using the Resnet and VGGnet architecture.