1. Predicting Simpsons characters

1.1-Introduction

Artificial intelligence has been gaining momentum over the last decade:efficient web search,speech and image recognition.AI allows the computer to operate in self-learning mode,without being explicitly programmed.AI involves algorithms - a LOT of them. Python provides ease of testing.Python has a lot of libraries for every need for any AI project.

1.2 Objectives of Research

The main objective of the project is training a convolutional neural network to recognize the simpsons characters using Keras.

1.3 Problem Statement

Here most of the simpsons characters look alike and difficult to identify if u don't watch the cartoon show.
Our goal is to differentiate them and predict them using our CNN model.

2. Review of literature

This project is built based on neural networking which can recognize different characters present in simpsons cartoon show. The data sheet taken from kaggle. And further development is done using keras from python.keras is used for simplicity.The approach to solve this problem will be based on convolution neural networking(CNN):multi-layered feed-forward neural networking able to learn many features.

3. Data Collection

The dataset is downloaded from Kaggle.   The dataset currently features 18 classes/characters (the data on Kaggle contains 20 classes, but currently we used only 10 characters for training). The pictures are under various size,scenes, could be cropped from other characters and are mainly extracted from episodes.The training set includes about 1000 images per character.

4. Methodology

We go through following phases for prediction of
the characters

- Model construction
- Model training
- Model testing
- Model evaluation

4.2 Data Modelling

Its construction depends on machine learning algorithms. In this project,it was neural networks. Such algorithms looks like:
1.begin with object:model=Sequential()
2.then consist of layers with their types:
model.add(type_of_layer())
After adding a sufficient number of layers the model is compiled. At this moment keras communicate with TensorFlow for constructing model.During model compilation it is important to write a loss function and an optimizer algorithm.It looks like:
model.compile(loss='name_of_loss_function',optimizer='name_of_optimizer_alg')
Later the model is trained in the following way: model.fit(training_data,expected_output)
After the training is completed ,it can be saved by: model.save("name_of_file.h5)

5. Findings and Suggestions

We got accuracy of 78% using 13 epochs.We can
increase accuracy by better training of the model.

Conclusion

In this work, I figured out what is deep learning. I assembled and trained the CNN model to predict the simpsons characters. I have tested that this model works really well with a small number of photos. I measured how the accuracy depends on the number of epochs in order to detect potential overfitting problem. I determined that 5 epochs are enough for a successful training of the model.