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## Emotion Recognition in Cartoons

*Anil Kulkarni, Syeda Ruheena Parveen, Shaik Huma Fatima, Syeda Nizba Tabassum, Sheeba Fatima*

Dept Of CSE ,GNDEC, Bidar /585403, India

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### ABSTRACT

Emotion Recognition is a field that computers are getting very good at identifying; whether it's through images, video or audio. Emotion Recognition has shown promising improvements when combined with classifiers and Deep Neural Networks showing a validation rate as high as 59% and a recognition rate of 56%. The focus of this dissertation will be on facial based emotion recognition. This consists of detecting facial expressions in images and videos. While the majority of research uses human faces in an attempt to recognise basic emotions, there has been little research on whether the same deep learning techniques can be applied to faces in cartoons. The system implemented in this paper, aims to classify at most three emotions (happiness, anger and surprise) of the 6 basic emotions proposed by psychologists Ekman and Friesen, with an accuracy of **80%** for the 3 emotions. Showing promise of applications of deep learning and cartoons. This project is an attempt to examine if emotions in cartoons can be detected in the same way that human faces can.

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### 1. Introduction

Emotion Recognition is a field that computers are getting very good at identifying; whether it's through images, video or audio. Emotion Recognition has shown promising improvements when combined with classifiers and Deep Neural Networks showing a validation rate as high as 59% and a recognition rate of 56%. The focus of this dissertation will be on facial based emotion recognition. This consists of detecting facial expressions in images and videos. While the majority of research uses human faces in an attempt to recognise basic emotions, there has been little research on whether the same deep learning techniques can be applied to faces in cartoons.

The system implemented here, aims to classify at most three emotions (happiness, anger and surprise) of the 6 basic emotions proposed by psychologists Ekman and Friesen, with an accuracy of 80% for the 3 emotions. Showing promise of applications of deep learning and cartoons.

This project is an attempt to examine if emotions in cartoons can be detected in the same way that human faces can.

### 2. Literature survey

- Yu, J., and D. Tao. 2013. *Modern Machine Learning Techniques and Their Applications in Cartoon Animation Research*. Vol. 4. John Wiley & Sons.
- ahou, S.E., Michalski V., Konda K.R., Memisevic R., and C.J. Pal. 2015. "Recurrent Neural Networks for Emotion Recognition in Video." *ICMI*, 467–74.

### 3. System Specification

#### 3.1 System Requirements

Entire work will be executed in Jupyter Notebook using Google Colab which is a free online cloud-based jupyter notebook environment which allows us to train, test and build Machine Learning and Deep learning models on CPU's, GPU's and TPU'

- Packages-Python libraries
- Deep learning tools
- Python 3.6
- TensorFlow
- Keras
- Matplotlib
- Misc libraries

### 4.Problem Definition

the majority of research uses human faces in an attempt to recognise basic emotions, there has been little research on whether the same deep learning techniques can be applied to faces in cartoons.

The system implemented here, aims to classify at most three emotions (happiness, anger and surprise) of the 6 basic emotions proposed by psychologists Ekman and Friesen, with an accuracy of 80% for the 3 emotions. Showing promise of applications of deep learning and cartoons.

### 5. System Design

By using this project we can provide information on emotion recognition in cartoons this project is very useful to detect emotions in cartoons.

### 6. Scope Of The Project

The purpose of this project is to measure how accurate a computer can correctly identify an emotion from a given set of images from a cartoon video.

This project is an attempt to replicate their success and to find out if these deep learning techniques can be applied to learn specific information in cartoons, the area of interest is emotions.

This decision is based on the fact that cartoons are known to express a lot of emotion, especially in the characters, and the choice being 'animated cartoons' is one where we can extract emotions from these characters in one or more videos.

This project is an attempt to examine if emotions in cartoons can be detected in the same way that human faces can

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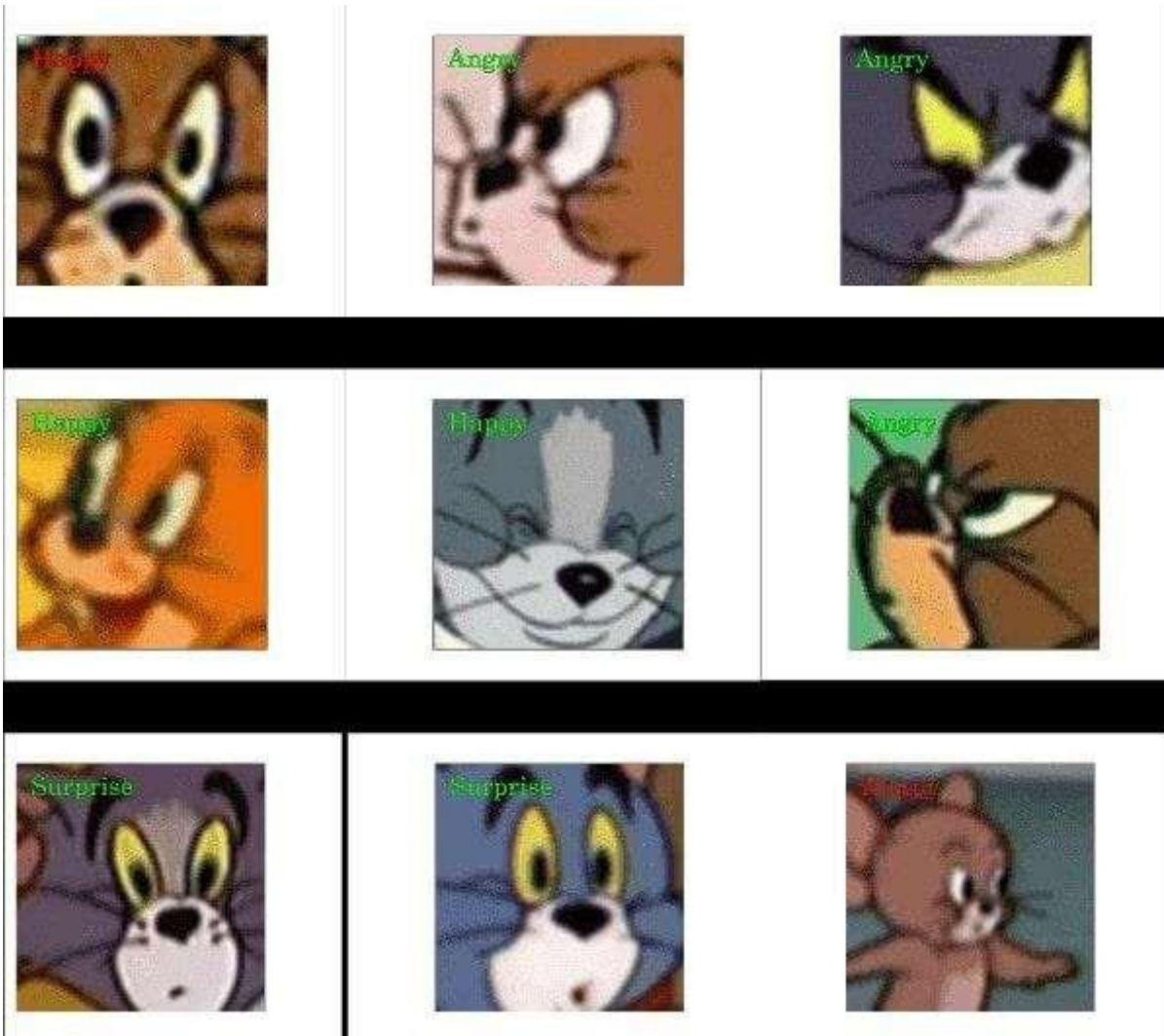
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### 8. Methodology used

- Information Gathering
- Design
- Coding
- Testing
- Review & Launch
- Maintenance

### 9. Expected outcome



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