Pokemon Analysis

In this assignment, I have done Analysis of the Pokemon Image dataset and extract the CP, HP, Stardust from the image. Along with Type (ID) of the pokemon using the KNN Classification algorithm as well as find the level and center circle for the pokemon.

- Type of the Pokemon
- CP
- HP
- Stardust for power up
- Level of the Pokemon

Grading:

35 base + ranking

Before starting to work on this assignment, I went through the dataset and saw not every image is of same resolution. And some has really bad resolution. So my first task way to resize the images into single resolution.

To resize the image i used imresize function in matlab. After this i decided to use OCR library to extract the details like HP, CP, and stardust from the images.

I did little bit of preprocessing separately for all this functions. Each one requires different type of preprocessing because of background color, contrast and how text is written. Preprocessing includes adjusting brightness, filters like gaussian noise removal tools like wiener etc.

For each function i crop the image into small part in which the text is shown. And used cop image in OCR to find the HP,CP, and Stardust.

After using this i got 31% accuracy on Validation for the CP, 82% on HP and 71% on the stardust which you can see in the following image.

For finding the ID I, used similar method which i used for the KNN image Classification on last assignment. And got the accuracy of 58%.

To find the level and center circle of the images, first i found the center circle using the imfindcircle function in matlab. With custom parameter (hyperparameter tuning) and found the center of circle of the pokemon level.

I used points to find the level of the pokemon and once again used imfindcircle to detect the level circle (point). I was able to successfully get this level for more than 70% of the pokemon.

The pokemon's which i was not able to detect level if

1) Resolution of pokemon is very low like 200*360
2) If the background of the pokemon contains circle theme (mostly for Normal Type of Pokemon)

But other than this I was successfully able to detect the Level of the Pokemons.

below image shows Level detection.

This was one of the most Interesting assignment i have ever done. I really enjoyed working on this.