**Computer Vision**

**Final Project**

**Topic:** Pokemon Recognition

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Overview:

We are tasked to recognize pokemon, and their stats obtained from the Pokemon Go screenshots.

**Preprocessing:** In the first step, the preprocessing is done on the image to resize and slightly smoothen it with the Gaussian filter.

**Pokemon Recognition:** For identifying pokemon, I have cropped the patch from the resized image where pokemon is approximately. SURF Features are extracted and K means clustering is applied to create a codebook which consists of the cluster centers. This code book is then used to create histogram which is the bag of words for a particular image.

We get as many histograms as the number of images. This is our training feature. During the testing phase a histogram is created of the test image using the stored codebook. A k nearest neighbor algorithm is then applied to determine the most appropriate classification for the test image.

**Stardust, CP, HP recognition:** For each of the stat, a template is extracted from the image. To determine the position where the value of the corresponding stat is in the image, a normalized cross correlation is done between template and region where the stat could be present. A patch is extracted which displays the value of the stat. Using the templates stored of the digits in the binary format, the template is superimposed to the digits and the correct value is found.

**Level, Semicircle:** The level and the semicircle centers are determined using approximate position on the resized image.

**Results:**

Accuracy on the validation dataset is as shown below:

