

## **READING DIGITS IN NATURAL IMAGES WITH UNSUPERVISED FEATURE LEARNING**

**INTRODUCTION:-**In this paper our aim is to read digit in natural images with unsupervised learning. It is very difficult to read text in images because they have different font , different light intensity ,distortion .problem of getting text from natural background is hard due to corrupted text by background .in this we will see how to read house no. printed in front of house(called SVHN). we will see success of feature learning algorithm in our scenario and why traditional feature are not efficient.

**SVHN DATA SET:-**there are two stage to read house number. The first one is detection that that locates house number in image. Second one is a recognition stage that performs a search over possible character locations in the detected house number, classifying each candidate frame as one of ten digits (0 through 9).the **SHVN** data are taken from large street view images .the data consist of 6,00,000 label character available in two format. One is FULL NUMBER (original ,variable resolution, transcription of digits) and second one is CROPPED DIGIT(all digit resized to 32 cross 32 such that no effect on aspect ratio distortion).the data set is divided in train set(70,000 images) ,test set (26000 images) ,extra train set(5,31,000 images).due to no vast intra-class variation and complex photometric distortion ,recognition is more challenging.

**MODELS:-** A main thrust of our investigation has been to determine how features generated by feature learning systems compare to hand-constructed feature representations that are commonly used in other computer vision systems.in **HAND CRAFTED FEATURE** we have the features which are most popular are HOG feature an off-the-shelf cocktail of binary image features. In **LEARNED FEATURE** there are two main algorithms one is stacked sparse encoder and other one is K-means based system. A major drawback of many feature learning systems is their complexity. These algorithms usually require a careful selection of multiple hyperparameters such as learning rates , momentum, sparsity penalties, weight decay, and so on that must be chosen through cross-validation.

**EXPERIMENTAL RESULT:-**K-mean algorithm have better accuracy (90%).where stacked sparse auto encoder have 89.7% accuracy similar to K-means. Hand

Crafted Feature have less accuracy in which HOG have 85%. And BINARY FEATURE have 63.3%.the Human performance is 98%.Human performance varies according to height in pixels.

**APPLICATION:**-it is used in improving map service and automatic detection and recognition of house number in street view images.

**CONCLUSION:**-in this paper we have applied unsupervised feature learning successfully to identify digit in street view images .and we showed this learning feature have better performance than hand crafted feature learning process .But we have still room for improvement to reach near human performance.