**Project** – Digitization of Hindi handwritten text overcoming challenges like poor and non-standard handwriting. A solution that can undertake Optical Character Recognition (OCR) on handwritten text in Hindi language.

In the modern era it is necessary to digitize text and preserve the soft copies. Hindi is one of the widely spoken languages in India. But even today it is a challenging task to digitize the Hindi scripts with high accuracy due to the complexity of the characters. Unlike Latin script, Devanagari script has 12 vowels and 35 consonants which results in large number of combinations. The variations in handwriting and similarity in the words of Hindi language makes it difficult to distinguish.

**Idea/approach:**

AKSHARA is a web app designed to implement Digitization of hand written Hindi text (Devanagari script) images.

Users can upload an image of the hand written Hindi text which is then uploaded to the server and is processed using CNN techniques. The model will be trained using large scale data sets of various Hindi hand written text. The user need not manually crop or segment the characters. Deep learning algorithm itself performs pre-processing, character segmentation and feature extraction.

There are multiple OCR Softwares which recognizes and converts text in an image to editable text. These Softwares have an average accuracy in the range of 60-70 %.

We aim to build an OCR using deep learning methods to convert the handwritten Hindi text image to editable Hindi text with over 70% accuracy.

There are many deep learning algorithms which can be used for our case. The advancements of computer vision with deep learning have been constructed and perfected with time, primarily over one particular algorithm - A convolutional Neural network (CNN).

CNN can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. ConvNets have the ability to learn the filters/characteristics of characters of the script.

A ConvNet is able to successfully capture the Spatial and Temporal dependencies in an image through the application of relevant filters. The architecture performs a better fitting to the image dataset due to the reduction in the number of parameters involved and reusability of weights. Thus, making it perfect for recognition of Hindi script.

Various techniques are applied to the characters of the handwritten text such as pre-processing, character-segmentation, feature extraction for the data to have proper values and decrease noise in the data. We require a huge amount of data as deep learning methods require a lot of data to accurately predict the possible output.

Training the data in simply poor handwriting can be leading to overfitting of data, therefore reducing accuracy. These problems can be solved by using dropout or dataset increment method which helps in maintaining accuracy.

With the help of AKSHARA an user can upload an image with handwritten text and converts it to editable Hindi text (Devanagari script) and allows user to save the converted text into pdf format.