Project Title: Handwritten digit recognition | **Project Design Phase-I - Solution Fit** | **Team ID:** PNT2022TMID48602

Define CS, fit in

1. CUSTOMER SEGMENt

User is the customer who are capable to write.

CS

6. CUSTOMER CONSTRAINTS

CC

It requires much more computation than more standard OCR Technique

It is not done in real time as a person writes and therefore not appropriate for immediate text input

5. AVAILABLE SOLUTIONS

AS

The established CNN model can be determined and recognized hand written digits with high accuracy as it combines the weight of convolutional layers during feature extraction with fully connected layers.

- Deep learning/CNN
- SVM
- Gaussian Naive Bayes
- Decision tree
- Random forests

Explore AS, dif

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS

J&P

User will approach tis project by using a three layer neural network

Input Laye:

Distributes features to next layer for calculation of activation of next layer

Hidden layer:

They are made of hidden units called activation providing non linear for network

Output layer:

Output units provides us with the final prediction of neural network on the basis of which final prediction can be made.

9. PROBLEM ROOT CAUSE

RC

Humans could not remember thousands of individual handwriting and some of them could not identify the handwriting.so,we use these techniques to reduce the workload of human.

7. BEHAVIOUR

BE

Computer uses the clear photocopy of individual handwriting to recognise and fetch the unique required handwriting

Focus on J&P, tap into BE, understand RC

3. TRIGGERS

It is attracting many researchers due to its usage in a number of machine learning and computer vision application.

Quicker and easier recognition makes human to use this technique

However there is a limited work on arabic patteren digits since arabic pattern digits are more difficult than english pattern.

10. YOUR SOLUTION

SL

In our work ,filter size or determined by calculating the sice of ERF.Proposed CNN architecture has achieved a recognition accuracy of 99.98 percentage on the MNIST handwritten digits data set and 99.40% with the same dataset and contaminated with 50% noise with the usage of batch normalisation we can speed up the training, reduce training and teaching time,in addition to lowering the sensitivity initialisation

8.CHANNELS of BEHAVIOUR

CH

8.1 ONLINE

In Online handwriting recognition sensor picks up the pen tip movements as well as pen up/pen down switching.

8.2 OFFLINE

Offline handwriting recognition often referred as optical character recognition is performed writing is completed by converting the handwritten document into digital form.

4. EMOTIONS: BEFORE / AFTER

EM

BEFORE:Users could not understand the various digits written by many different people

AFTER:Users can easily recognise the handwritten digits and computer can store more than thousands of handwritting