Project Design Phase-I

Proposed Solution

Date	Week 3&4
Project Name	A Novel method for handwritten digit recognition system
Team Members	Rajeev Krishna, Priyadharshan R, Maanas Karthikeyan and R Sai Prakash

Proposed Solution Template:

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	Handwriting recognition is one of the compelling research works going on because every individual in this world has their own style of writing. It is the capability of the computer to identify and understand handwritten digits or characters automatically. Because of the progress in the field of science and technology, everything is being digitized to reduce human effort. Hence, there comes a need for handwritten digit recognition in many real-time applications. Our University is still relying on manual processing which is both time consuming and error prone. Handwriting recognition system with a reliable accuracy can make an impact in these business fields.
2.	Idea / Solution description	MNIST data set is widely used for this recognition process and it has 70000 handwritten digits. We use Artificial neural networks to train these images and build a deep learning model. We opt to use multi-layer neural networks as deep NN. Due to the fact that data is Image, the best type of neural network satisfying our goal is **Convolutional Neural Networks**. As we have to do for most of the data, normalization plays an important role in our process. Before doing any tasks, pre-processing images (our data-set) is highly recommended. Consequently better accuracy will be achieved by pre-processed data. After pre-processing and normalizing, the prepared data set could be used as input to our deep convolutional neural network. Then deep NN

		will be run and fit to our data and the result will be produced by that.
3.	Novelty / Uniqueness	Web application is created where the user can upload an image of a handwritten digit. this image is analysed by the model and the detected result is returned on to UI. One of the major decisions had to be made was choosing the suitable programming language satisfying our goal for extracting knowledge from our data. After some searching the suitable decision has been made by selecting Python as the project programming language. Due to the fact that, a lot of tools and frameworks are available for Python to create powerful Artificial Neural Networks. Also IBM Watson helps to predict future outcomes, automate complex processes, and optimize user's time. And also the result accuracy will be increased from 70% which is the accuracy of the test results that the previous developed codes produced.
4.	Social Impact / Customer Satisfaction	People can struggle to read others' handwriting. The handwritten digits are not always of the same size, width, orientation as they differ from writing of person to person, so the general problem would be while classifying the digits. Can automate data entry jobs and speed up evaluation process.
5.	Business Model (Revenue Model)	Can collaborate with other institutions to speed up the evaluation process which improves customer experience.
6.	Scalability of the Solution	This project will help us to detect digits more precisely. Also we can develop this model to recognize alphabets.