Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	03 October 2022
Team ID	PNT2022TMID48537
Project Name	Project -Novel method for handwritten digit recognition
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Gmail
FR-2	User Confirmation	Confirmation via Email
FR-3	preprocessing step	i).User should remove the hooks of the strokes by changing the angle threshold. ii).Filter the noise by using a smoothing technique which is the combination of cubic spline and equal interpolation methods.
FR-4	Feature extraction	i).The data should be gathered as different samples. ii).here,every character is represented as a feature vector,which becomes its identity.
FR-5	Selection step	It is associated with single feature classifier and a genetic algorithm
FR-6	Classification step and verification	i).The data is classified using MNIST digits classification dataset,which contains 60,000 training images and 10,000 testing images. ii).Verification is performed by segmenting two connected digits using the oriented sliding window. iii).It employees verification using SVM classifiers.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	It is used in the detection of vehicle **numbers,banks for reading cheques,post offices for arranging letters**, and many other tasks.
NFR-2	**Security**	i)The system not only produces a classification of digits but also a rich description of the **instantiation parameters** which can yield information such as writing style.

		ii)The generative models can perform recognition driven segmentation
NFR-3	**Reliability**	i)Handwritten digit recognition are with 98% accuracy ii)**OCR technology** provides higher than **99%** accuracy with typed characters in high quality images
NFR-4	**Performance**	i) Most standard implementations of neural networks achieve an accuracy of **(98-99) percent** in correctly classifying the handwritten digits. ii) Beyond this number,every single decimal increase in the accuracy percentage is hard.
NFR-5	**Availability**	It is widely available in the fields of **Postal mail sorting,bank check processing,form data entry.**
NFR-6	**Scalability**	i) Character recognition from handwritten images has received greater attention in the research community of pattern recognition due to vast applications and ambiguity in learning methods. ii)Primarily, two steps including character recognition and feature extraction are required based on some classification algorithm for handwritten digit recognition.