Project Design Phase-II

Solution Requirements (Functional & Non-functional)

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| Date | 20 October 2022 |
| Team ID | PNT2022TMID02451 |
| Project Name | A Novel Method for Handwritten Digit Recognition System |
| Maximum Marks | 4 Marks |

# Functional Requirements:

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | Getting the handwritten digit input | The handwritten digit is obtained as input from the user as an image uploading or writing on the canvas. |
| FR-2 | Data preprocessing | Upgrades the image to make it ready for segmentation, by performing some tasks on the input image. |
| FR-3 | Segmentation & Feature Extraction | Segment the MNIST dataset images using edge detection technique and remove redundancy from the  data |
| FR-4 | Classification and Recognition | Passing the feature vectors as individual input to the classifiers or neural networks such as CNN. |
| FR-5 | Prediction | The deep learning model is trained and tested using the MNIST dataset, with accuracy > 90% |
| FR-6 | Evaluation | Ensure that the digit is correctly recognised by the model and produces accurate output. |

# Non-functional Requirements:

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

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | To identify and understand handwritten digits automatically, with high accuracy. |
| NFR-2 | **Security** | Ensures security, since uploaded images are not stored in any database |
| NFR-3 | **Reliability** | User-friendly web interface for the system. Process confidential information without data leakage. |
| NFR-4 | **Performance** | High, since artificial neural networks are used to  train the images and build deep learning model. Fast prediction using CNN algorithm. |
| NFR-5 | **Availability** | Using web application, anyone can easily access the  system, making it highly available for web and mobile browsers. |
| NFR-6 | **Scalability** | Performs well even if the count of input handwriting  increased, since MNIST dataset is used for recognition process. Low time consumption. |