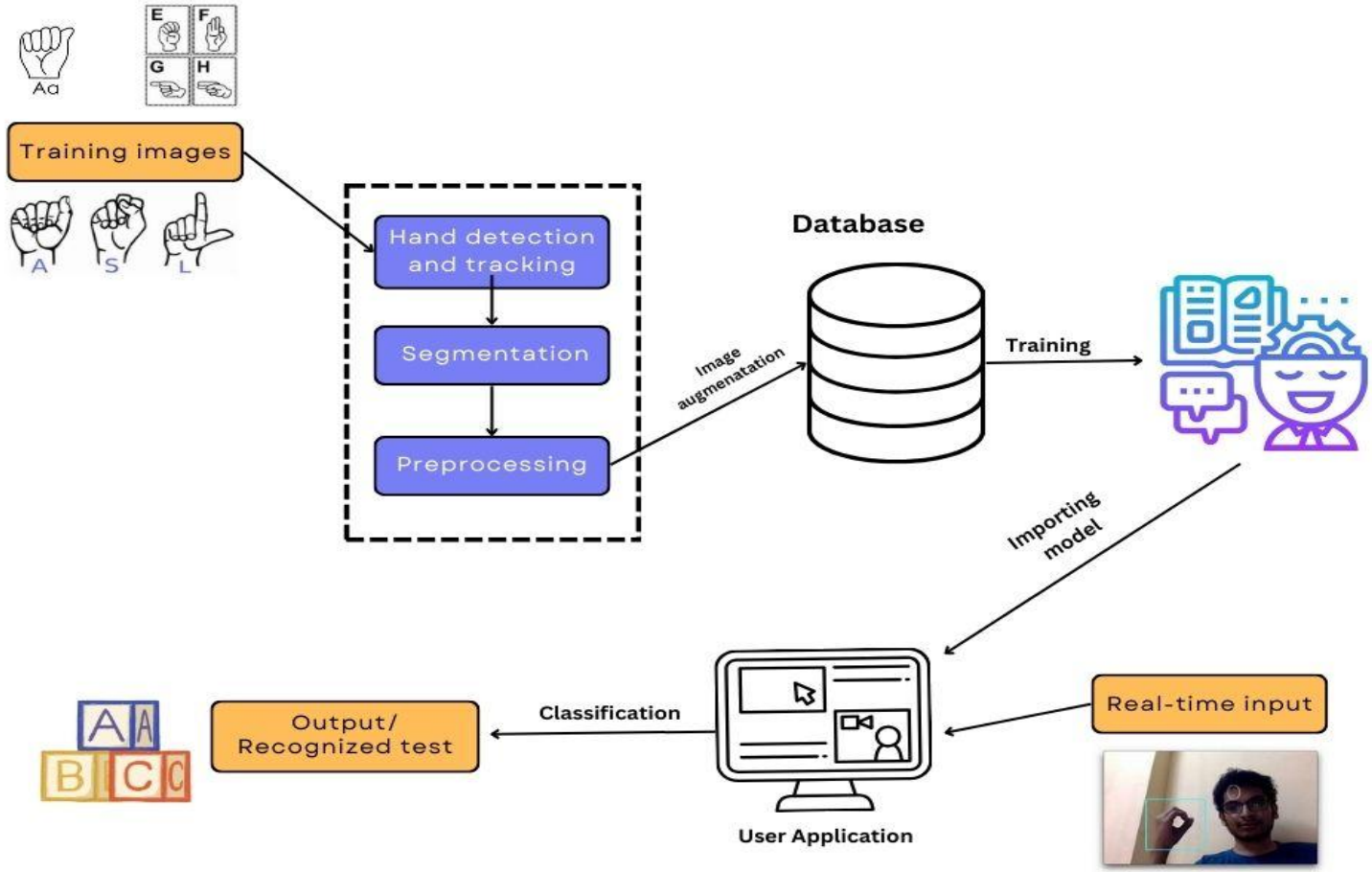
Project Design Phase-II
Data Flow Diagram & User Stories

Date	1 November 2023
Team ID	Team-591769
Project Name	ASL- Alphabet Image Recognition
Maximum Marks	4 Marks

Data Flow Diagrams:

The project commences with the input of ASL alphabet images, initiating a series of crucial steps in ASL recognition. First, hand detection and segmentation processes accurately isolate the hand from the background, ensuring precise analysis. Subsequently, image preprocessing techniques are applied to enhance image quality, preparing the data for machine learning. To improve the model's ability to generalize, image augmentation techniques introduce diversity within the dataset, which is systematically organized and stored in a database for efficient retrieval during training.

The heart of the project lies in the training of a deep learning model using this extensive database. This model is carefully fine-tuned and evaluated to achieve optimal ASL recognition performance. The final touch is a user-friendly web application that allows users to upload images of ASL hand signs. The application harnesses the trained model to interpret these images and provides corresponding ASL text, offering a streamlined solution for communication for the hearing-impaired. This comprehensive pipeline not only advances ASL recognition but also fosters inclusivity by making communication more accessible to a broader audience.


Training images
Hand detection and tracking
Segmentation
Preprocessing
Image augmenatation
Database
Training
Importing model
Real-time input
User Application
Classification
Output/ Recognized test

User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Deaf or Hard-of-Hearing communities	Project setup & Infrastructure	USN-1	Set up the development environment with the required tools and frameworks to start the alphabet image recognition system	successfully configured with all necessary tools and frameworks	High	Sprint-1
Deaf or Hard-of-Hearing Individuals	Development environment	USN-2	Gather a diverse dataset of images containing different types of ASL images(alphabet images) for training the deep learning model.	Gathered a diverse dataset of images depicting various types of ASL images	High	Sprint-1
Normal (Hearing) individuals	Data collection	USN-3	Preprocess the collected dataset by resizing images, normalizing pixel values, and splitting it into training and validation sets.	Preprocessed the dataset	High	Sprint-2
Researchers and Academics	Data preprocessing	USN-4	Explore and evaluate different deep learning architectures to select the most suitable model for the alphabet image recognition system..	We could explore various DL models	High	Sprint-2
	Model Development	USN-5	Train the selected deep learning model using the preprocessed dataset and monitor its performance on the validation set.	we could do validation	High	Sprint-3
	Training	USN-6	Implement data augmentation techniques (e.g., rotation, flipping) to improve the model's robustness and accuracy.	we could do testing	Medium	Sprint-3

	Model deployment & Integration	USN-7	Deploy the trained deep learning model as a API or web service to make it accessible for alphabet image recognition, integrate the model's API into a user-friendly web interface for users to upload images and receive garbage classification results.	we could check the scalability	Medium	Sprint-4
	Testing & quality assurance	USN-8	Conduct thorough testing of the model and web interface to identify and report any issues or bugs. fine-tune the model hyperparameters and optimize its performance based on user feedback and testing results.	we could create web application	Medium	Sprint-5