American Sign Language Recognition Using Hand Gestures

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Outline

- **Introduction**
  - Motivation
  - Problem statement
- Applicability of this project
  - Practical application
  - Features
  - Technologies used
- Working
- Conclusion & future scope

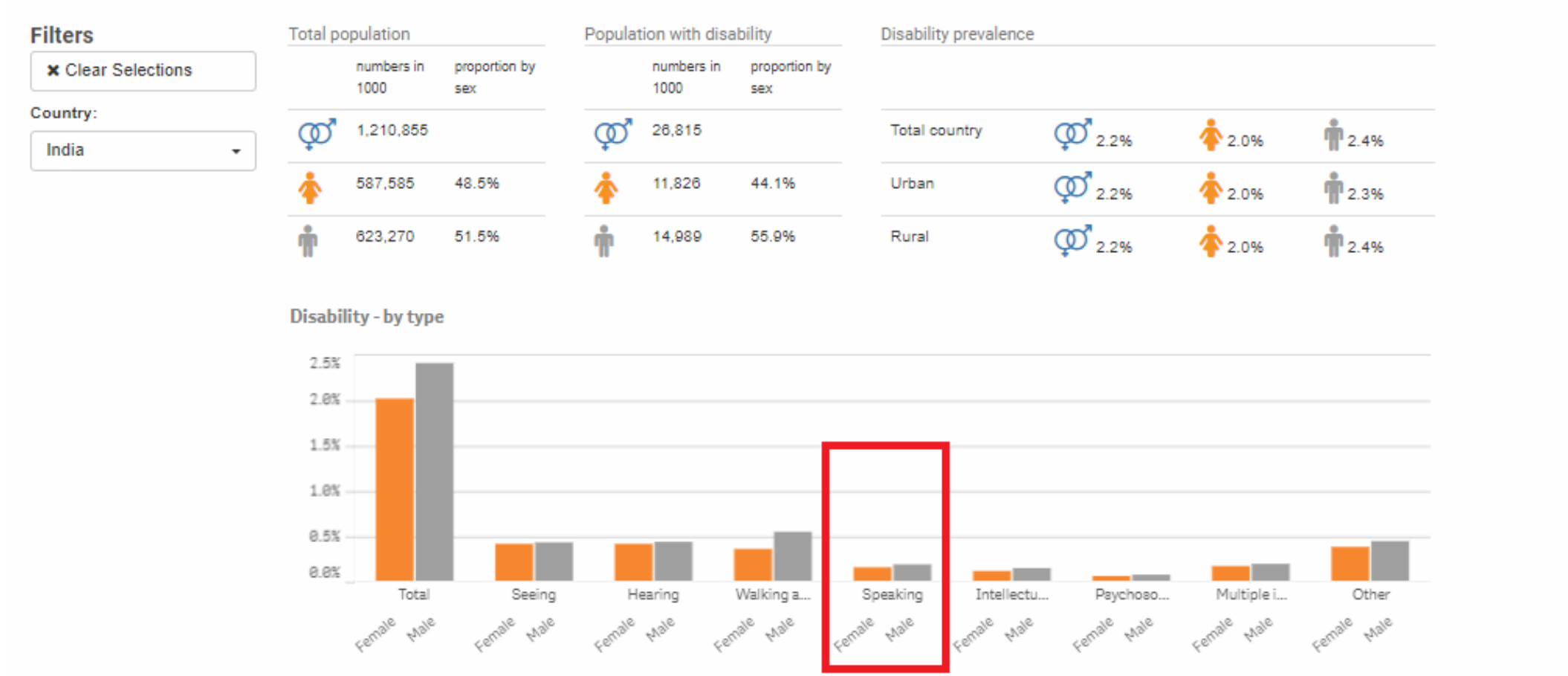
Introduction.

- Motivation

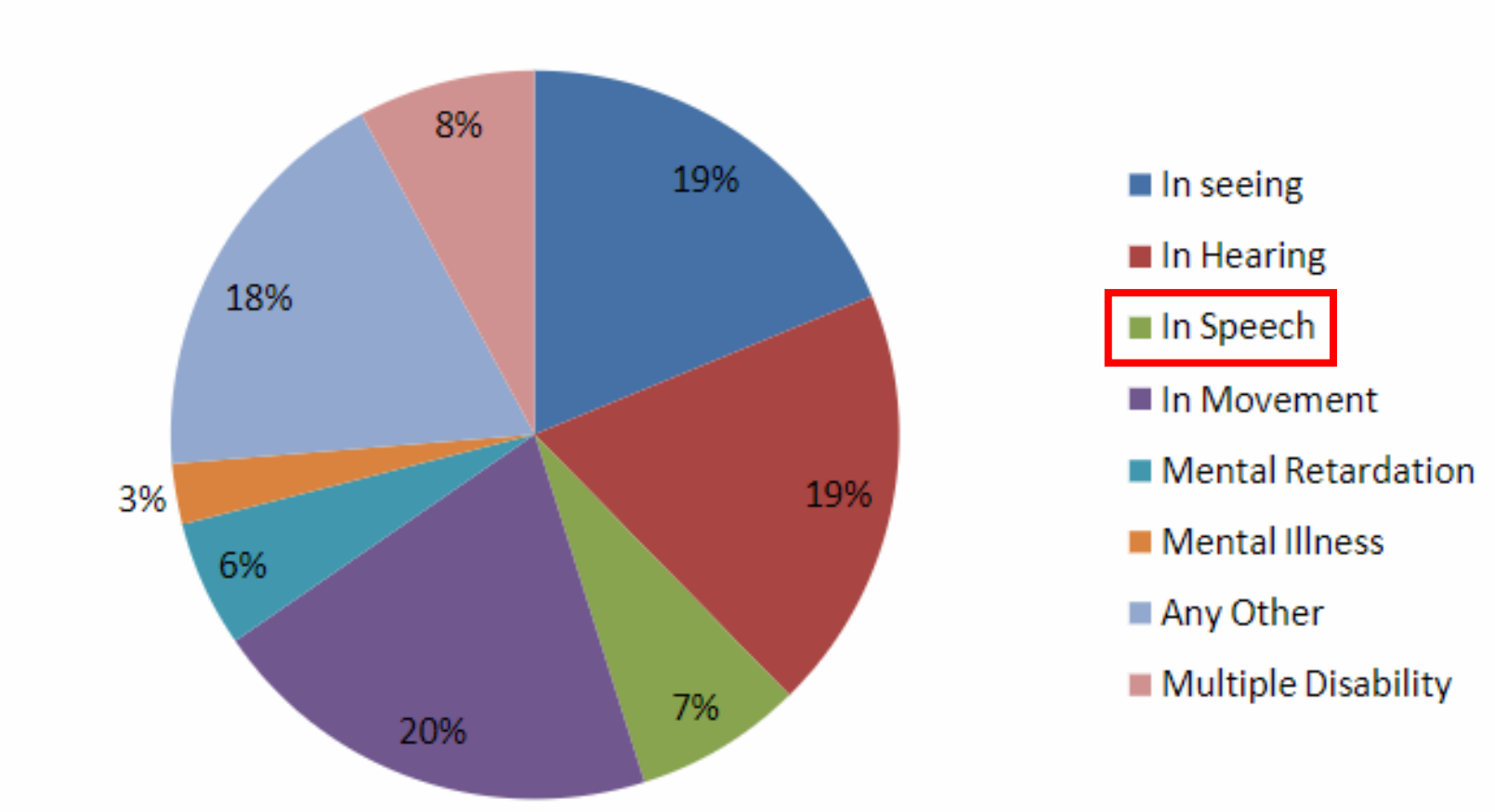
- A person with **speaking disorders** face major problems of expressing their emotions as freely in this world.

- “Not able to utilize” some of the new technologies.

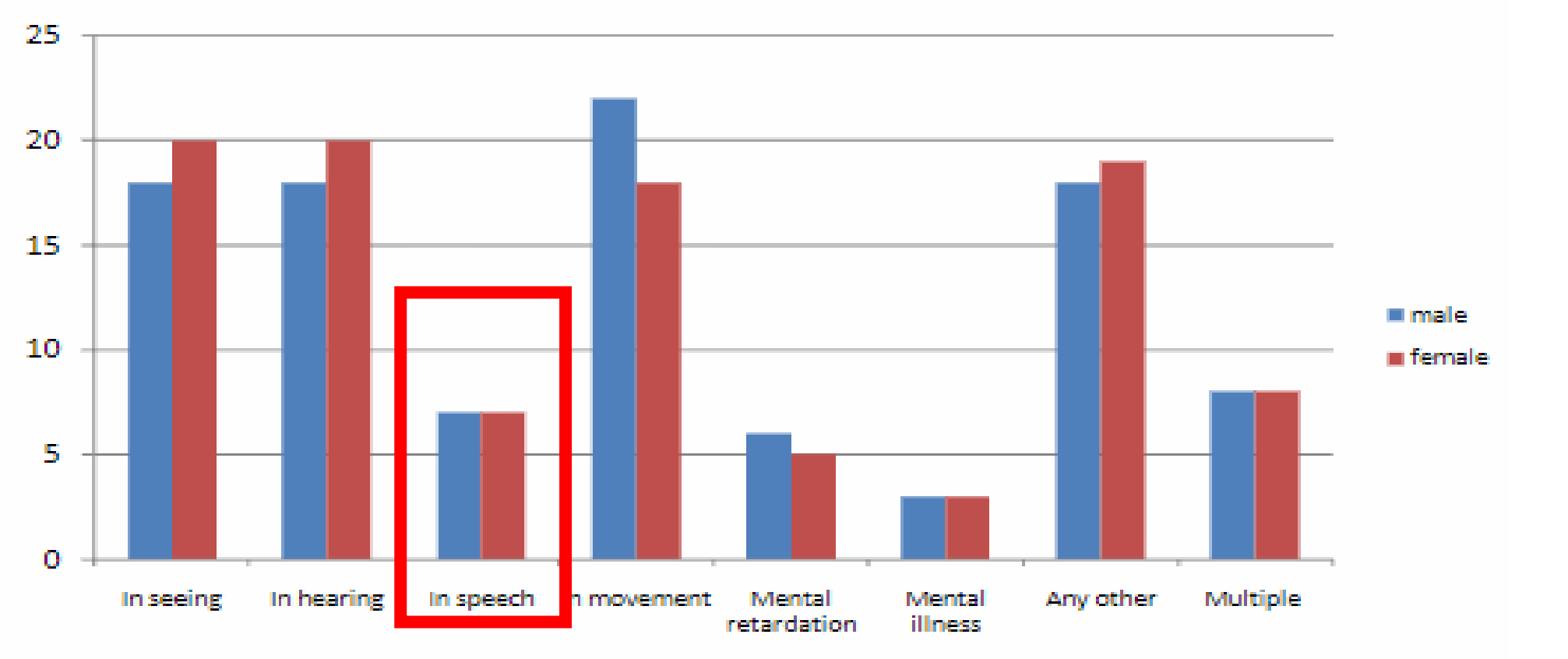
Statistics retrieved from United Nation Statistics Division



Disabled population by type of disability in India census 2011



Distribution disabled person by sex and by type of disability (%) in India Census 2011



Problem Statement

- Given a hand gesture, implementing such an application which detects pre-defined *American sign language (ASL)* in a real time through hand gestures and providing facility for the user to be able to store the result of the character detected in a txt file, also allowing such users to build their customized gesture so that the problems faced by persons who aren't able to talk vocally can be accommodated with technological assistance and the barrier of expressing can be overshadowed.

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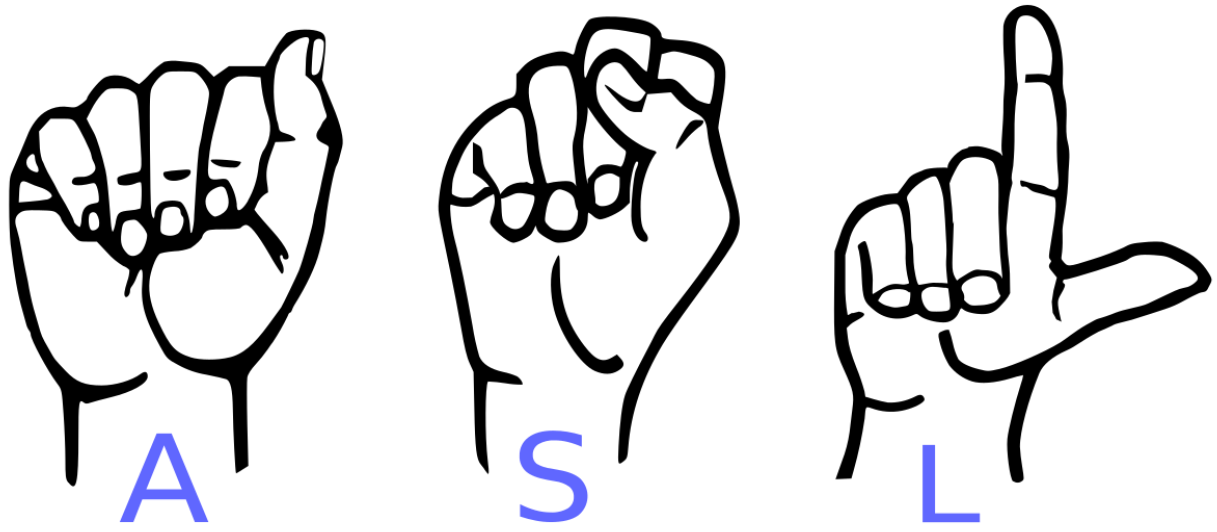
Practical application

- Serves the person who wants to learn and talk in sign languages

- A user need not be a literate person

Features of this application

- Real time **(ASL)** detection based on gesture made by user.
- Customized gesture generation.
- Forming a stream of sentences.
- TTS assistance mechanisms concerning to the illiterate people.



Technologies Used

- Python 3.6.
- TensorFlow framework, Keras API
- Real-time computer vision using OpenCV
- Industrial standard GUI application (PyQT5), Tkinter.
- Offline TTS assistance for python (pyttsx3 lib)

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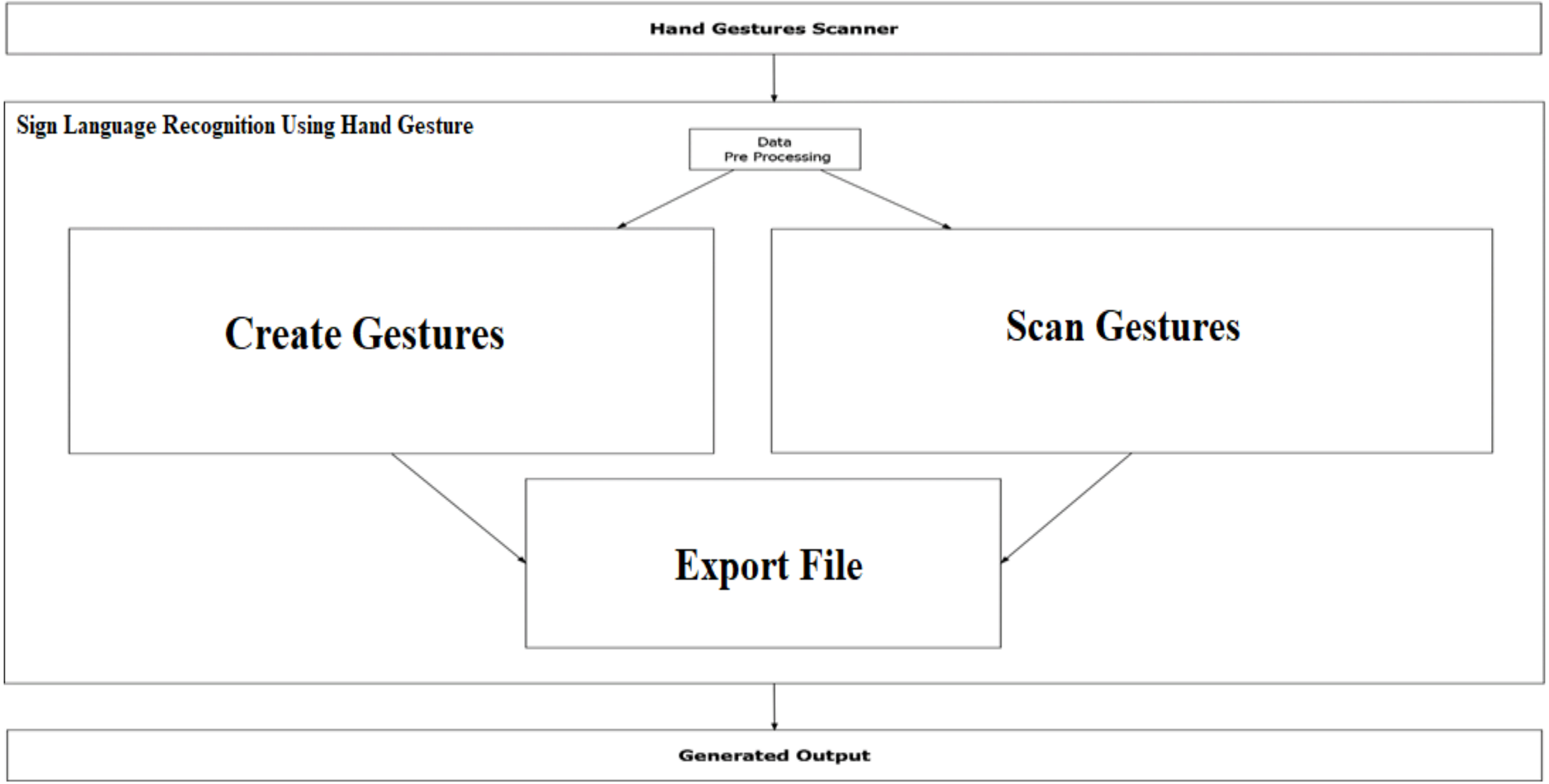
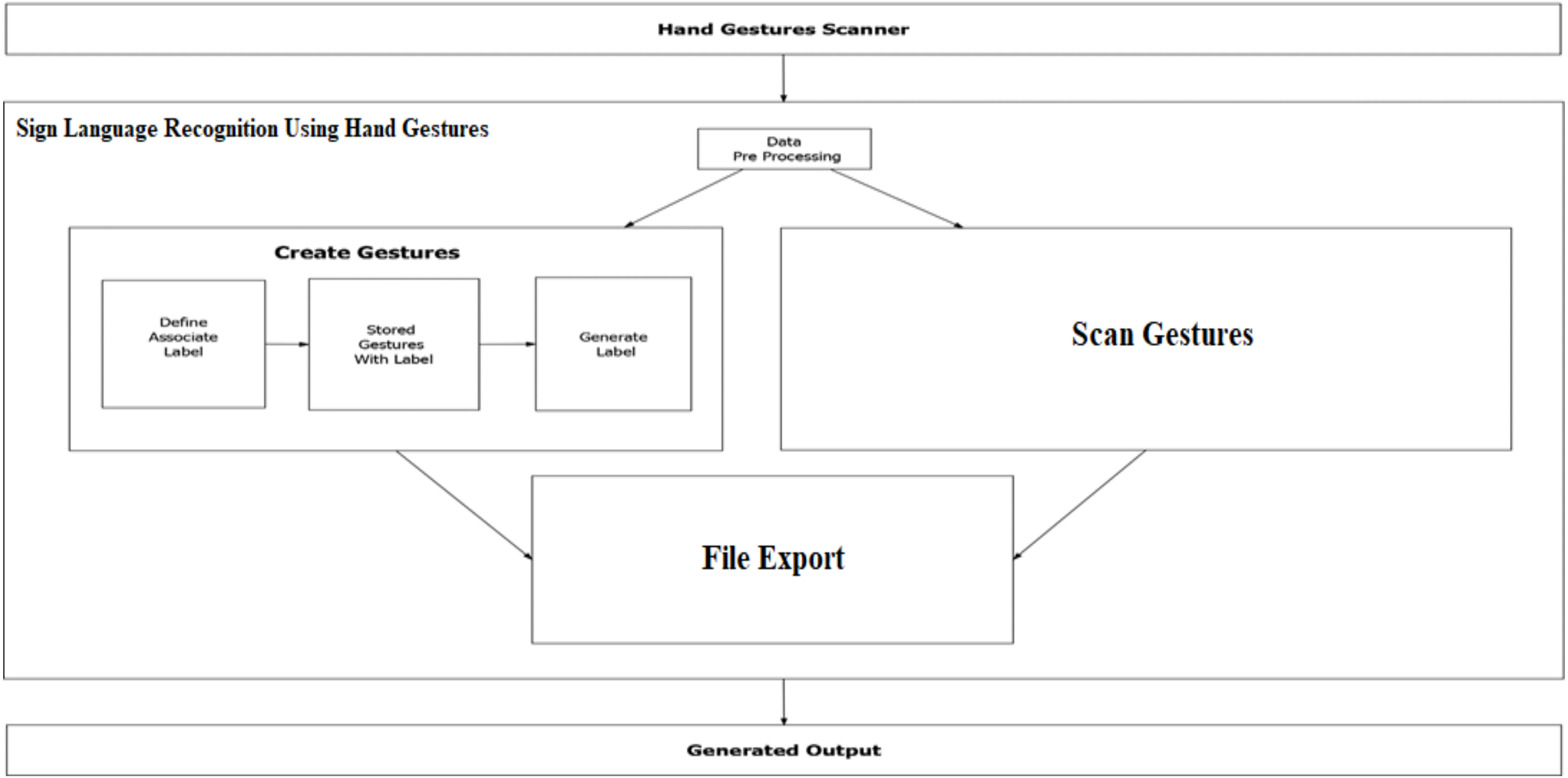
Core Modules

- Data Pre-Processing
- Scan Single Gesture
- Create gesture
- Formation of sentence
- Exporting

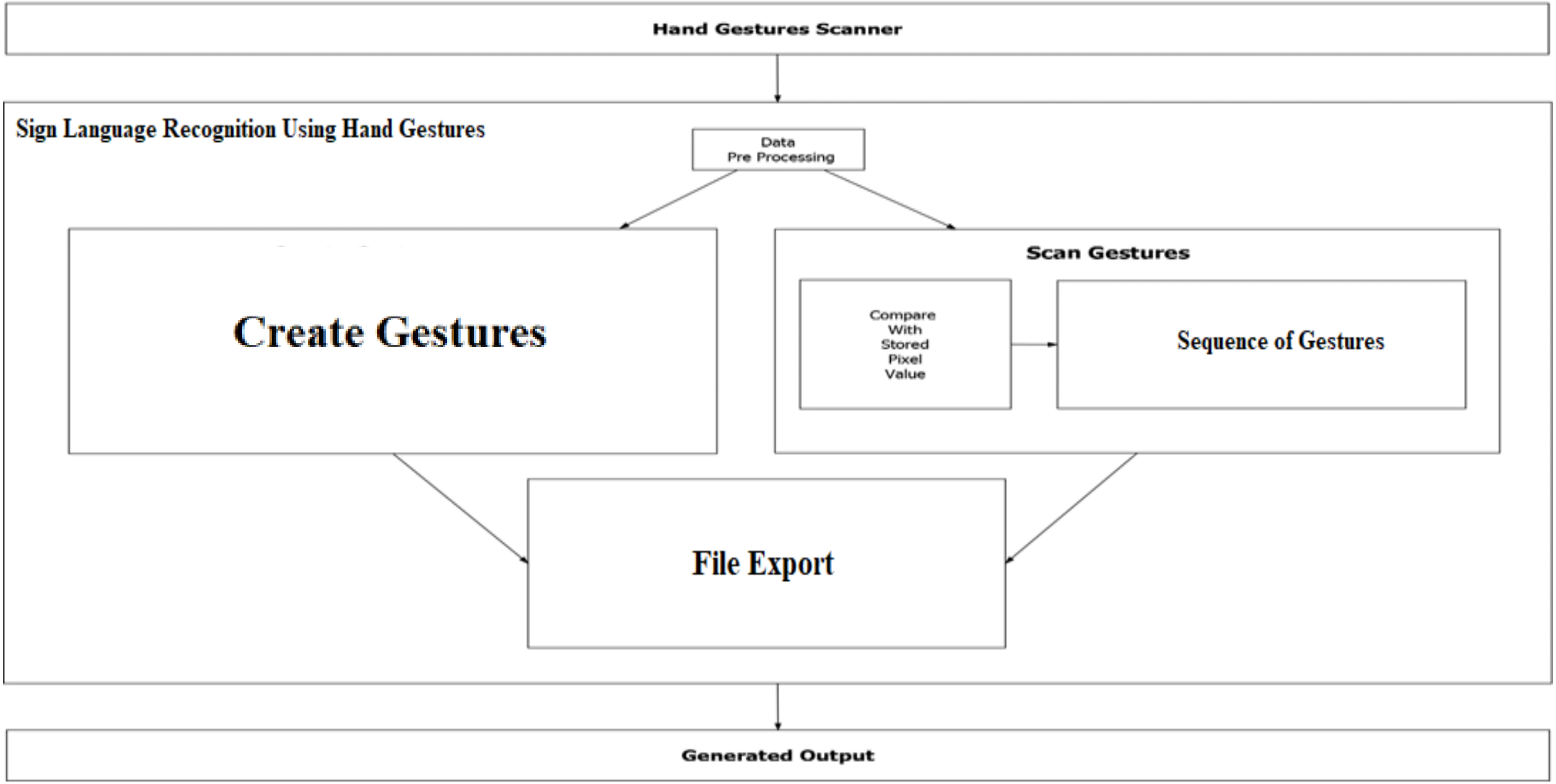
ASL Recognition Using Hand Gestures



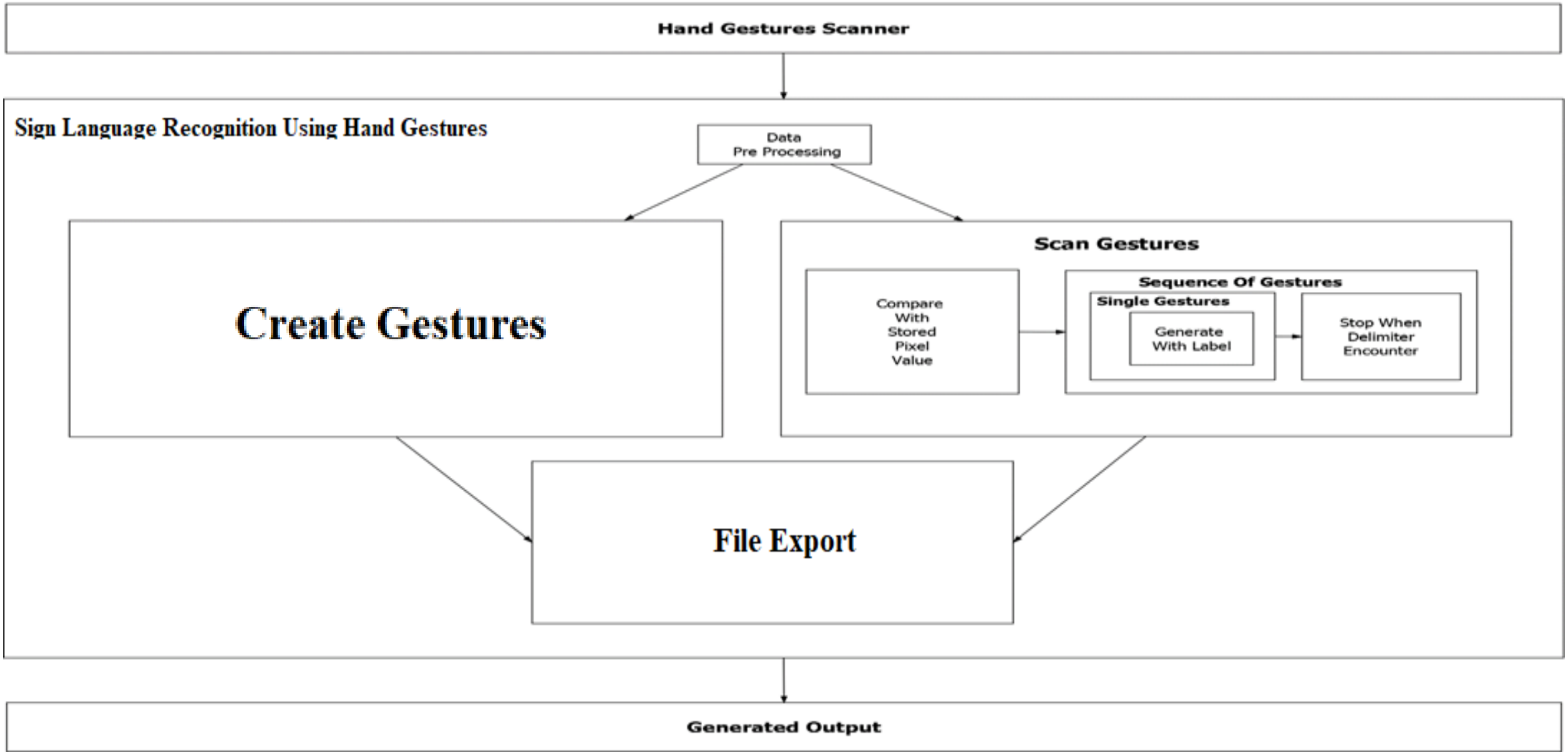
ASL Recognition Using Hand Gestures



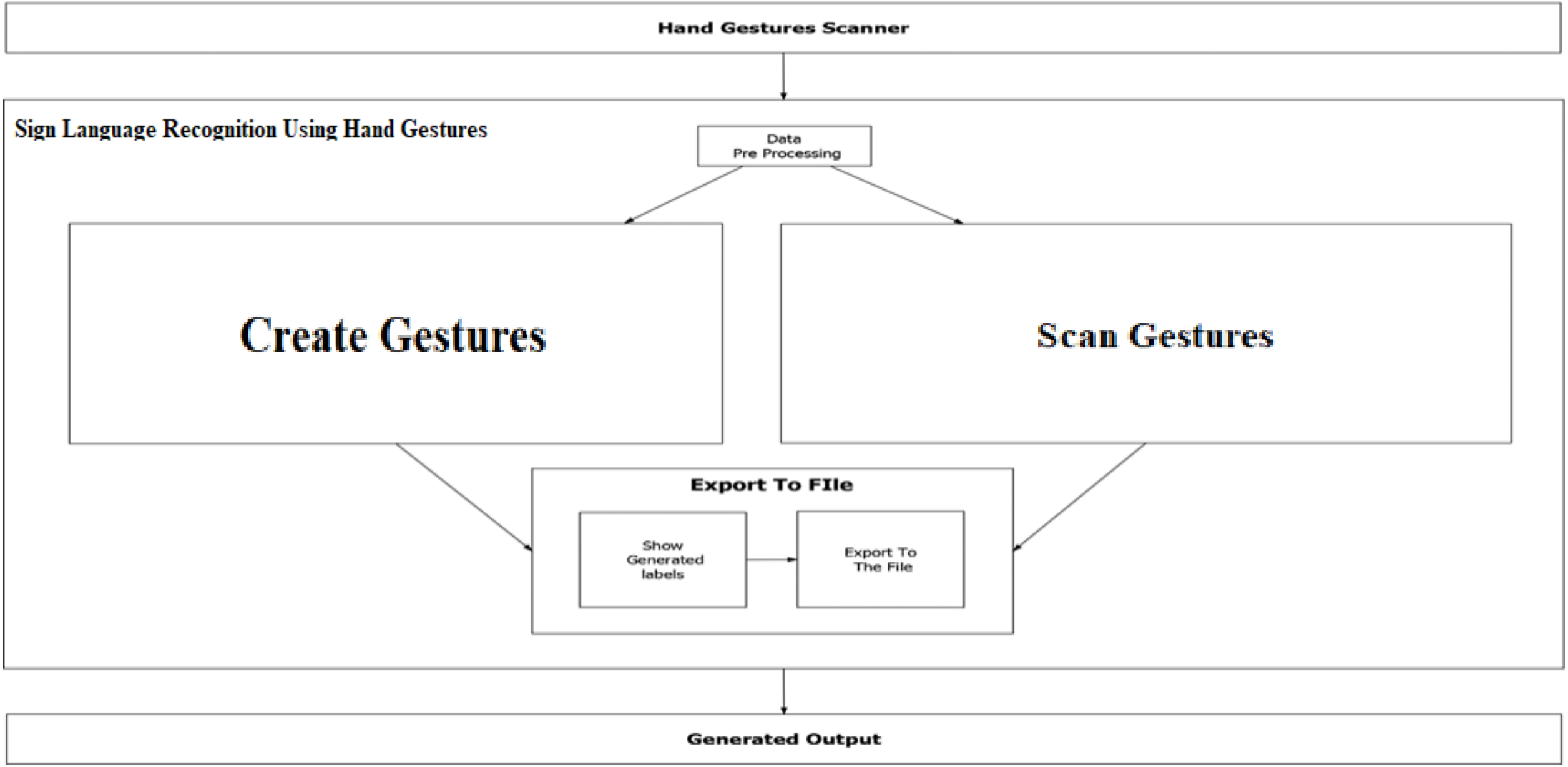
ASL Recognition Using Hand Gestures



ASL Recognition Using Hand Gestures



ASL Recognition Using Hand Gestures



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Conclusion

- Overshadowing some of the major problems faced by the persons having speech disorders.
- They can quickly learn what alphabet is assigned to which gesture with this application.
- Add-on to this custom gesture facility is also provided along with sentence formation.

Future Scope

- Integration to search engines and texting application.
- Detection of motion video sequence with TTS assistance.

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References

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