Literature Review

In the past decades, many researchers have delved into the world of sign language detection and came up with several applications. To facilitate communication between D&D persons and those who hear, it is crucial that their languages are detected. In the late 90's, sign language studies had gained new momentum particularly in the West. This marked an era when many research projects were initiated leading to a broader subject area in question. There have been several studies on the identification of hand gestures in Bangla sign language, but none on the application of the Random Forest Classifier Algorithm.

Research on Other Sign Language:

El-Din et all Developed a System "Sign language recognition(SLR) systems based on sensory gloves" for recognition of Arabic & American Sign Language[1]. G. Halvardsson et all use Convolutional Neural Networks (CNNs) and transfer learning to make computers able to interpret signs of the Swedish Sign Language (SSL) hand alphabet[2]. Arpita Halder & Akshit Tayade used Random Forest Classifier model for recognizing multiple sign languages like American Sign Language, Indian Sign Language, Italian Sign Language, Turkey Sign Language etc[3]. Akshatha Rani K & Dr. N Manjanaik use the ANN architecture model for Detecting American Sign Language[6]. N. Tazhigaliyeva et all utilize a previously developed neural network-based learning architecture to recognize Cyrillic manual alphabet, which is used for finger spelling in Kazakhstan. Luis-Pérez, Trujillo-Romero,and Martínez-Velazco utilized a set of Mexican Sign Language to make the robot perform specific tasks. The system recognizes and interprets 23 signs of the alphabet with the accuracy of 95.8% [8].

Research on Bangla Sign Language(BdSL):

Progya Paromita Urmee, Md. Abdullah Al Mashud, and Jasmin Akter conducted one of the greatest studies on the identification of Bangla sign language. They employed an Xception architecture-based Convolutional Neural Network (CNN) model to identify 37 distinct Bangla sign language signs[16]. For the purpose of detecting Bangla sign language, Dipon Talukder and Fatima Jahara suggested an object identification model based on YOLOv4[17]. If we analyze previous work made on Bangla sign language detection, we can see that most popular method to classify hand gesture is SVM, ANN and KNN[15]. Oishee Bintey Hoque & et all uses Convolutional Neural Network based object detection technique to detect the presence of signs in the image region and to recognize its class[18]. Haque et all use the DenseNet201 and ResNet50-V2 models for detecting the Bangla sign language[21]. Angona et all use deep convolutional neural network (CNN). CNN has been introduced in this model in form of a pre-trained model called "MobileNet" which produced an average accuracy of 95.71% in

recognizing 36 Bangla Sign Language alphabets. Farhad Yasir el all use SHIFT based approach for Bangla Sign Language Recognition.

Table

Paper	Published Year	Approach	Accuracy
1	2020	Flex sensors, MPU6050, Arduino Mega, and Python GUI.	95%
2	2021	CNN	85%
3	2021	SVM, KNN, Random Forest, Decision Tree, Naive Bayes, ANN, MLP	SVM = 99.15% KNN = 99.21% RF = 98.57% DT = 98.57% NB = 53.74% ANN = 97.12% MLP = 94.69%
4	2019	DeepHand handshape	71.3%
5	2018	SVM,CNN	95%
6	2021	ANN, ASL, deaf-mute, hand gesture	74%
7	2021	Sign4PSL	80%

8	2017	CNN	77.2%
9	N/A	N/A	N/A
10	2020	3D-CNN, ConvLSTM	97.4%
11	2020	CNN	99.86%
12	2020	CNN	96%
13	2017	NNM	84.11%
14	2020	CNN	92.70%
15	2018	SHIFT & CNN	N/A
16	2019	CNN	98.93%
17	2020	YOLOV4	97.95%
18	2018	Faster R-CNN	98.2%
19	2016	HOG, SVM, TTS, K-NN	86.53%
20	2017	CNN	97%