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| Title | Bilingual Sign Language Recognition: A YOLOv11-Based Model for Bangla and English Alphabets | | |
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| Abstract |  |
| Communication through sign language effectively helps both hearing- and speaking-impaired individuals connect. However, there are problems with the interlingual communication between Bangla Sign Language (BdSL) and English Sign Language (ASL) due to the absence of a unified system. This study aims to introduce a detection system that incorporates these two sign languages to enhance the flow of communication for those who use these forms of sign language. This study developed and tested a deep learning-based sign-language detection system that can recognize both BdSL and ASL alphabets concurrently in real time. The approach uses a YOLOv11 object detection architecture that has been trained with an open-source dataset on a set of 9556 images containing 64 different letter signs from both languages. Data preprocessing was applied to enhance the performance of the model. Evaluation criteria, including the precision, recall, mAP, and other parameter values were also computed to evaluate the model. The performance analysis of the proposed method shows a precision of 99.12% and average recall rates of 99.63% in 30 epochs. The studies show that the proposed model outperforms the current techniques in sign language recognition (SLR) and can be used in communicating assistive technologies and human–computer interaction systems. | |