Online Multilingual Dictionary Using Hamburg Notation for Avatar-Based Indian Sign Language Generation System

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Abstract : Sign Language (SL) is used by deaf and other people who cannot speak but can hear or have a problem with spoken languages due to some disability. It is a visual gesture language that makes use of either one hand or both hands, arms, face, body to convey meanings and thoughts. SL automation system is an effective way which provides an interface to communicate with normal people using a computer. In this paper, an avatar based dictionary has been proposed for text to Indian Sign Language (ISL) generation system. This research work will also depict a literature review on SL corpus available for various SL s over the years. For ISL generation system, a written form of SL is required and there are certain techniques available for writing the SL. The system uses Hamburg sign language Notation System (HamNoSys) and Signing Gesture Mark-up Language (SiGML) for ISL generation. It is developed in PHP using Web Graphics Library (WebGL) technology for 3D avatar animation. A multilingual ISL dictionary is developed using HamNoSys for both English and Hindi Language. This dictionary will be used as a database to associate signs with words or phrases of a spoken language. It provides an interface for admin panel to manage the dictionary, i.e., modification, addition, or deletion of a word. Through this interface, HamNoSys can be developed and stored in a database and these notations can be converted into its corresponding SiGML file manually. The system takes natural language input sentence in English and Hindi language and generate 3D sign animation using an avatar. SL generation systems have potential applications in many domains such as healthcare sector, media, educational institutes, commercial sectors, transportation services etc. This research work will help the researchers to understand various techniques used for writing SL and generation of Sign Language systems.

Keywords : avatar, dictionary, HamNoSys, hearing impaired, Indian sign language (ISL), sign language
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