

Chinese Sign Language Synthesis and Its Applications

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Abstract

The Sign Language is the communication language for deaf-mute community. Everywhere in the world may have their own sign language. There are over 20.57 million deaf people with thousand kinds of language in China. Hence a set of standard Chinese Sign language for the Deaf-Mute has been revised several times by Chinese Deaf-mute Association supported by the Chinese Government. The updated standard Chinese sign language will help you easily communicate with any deaf people in China.

“How can we learn it in a short time and convenience way”? The traditional face-to-face and tape recorder teaching methods can't express meaning well due to time and space limitation. Then a Chinese sign language synthesis system has been developed. The system uses artificial intelligence and computer graphic technology to demonstrate the Chinese sign language from optional customers by a 3-dimensions virtual human. The software will help to demonstrate a standard Chinese sign language by a 3-dimensions virtual human if you print Chinese language (Fig.1).

sign words set must have expressions to make the gesture understood. Therefore, face animation and expression synthesis is more important for the whole system. Second is motion retargeting technology, which can retarget the standard data to any given character modal to make the animation data singer-independent. And the third is synchronization modal between gesture and lip motion. There are also several characters of the system: first is the system covered large vocabularies of Chinese Sign Language, totaling up to 5596 sign language terms, 30 Chinese finger languages and 24817 synonym, almost contained all of contents of middle schools and elementary schools text book in China. Second is it realized study interaction and not limited by time and space. Third is customers could choose from several human images or models. And last are clear interface, easy operating and free adding new sign language. The experiment shows that the software was given a score of 92.98 for visual and understanding finger spelling, 88.98 for words, 87.58 for sentences by the students from these Deaf-mute Schools. The system has a great significant for standardizing, studying and popularizing Chinese Sign Language and plays a very important role for the hearing impaired society. This system could be used in all kinds of service business and public places, and could bring a great convenience for the deaf-mute's life and study, etc WebSigner (Fig.2(a)), TVSigner (Fig.2(b)), OnlineSigner (Fig.4(b)).

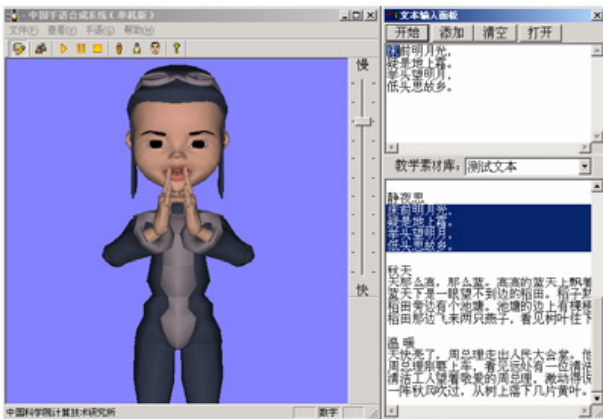


Fig.1: Chinese Sign Language Synthesis System

This system has integrated advanced research results and key technologies both domestic and abroad. There are three new technologies being developed in our system. First is realistic face animation, in sign language, there are about 1/3 words of the whole



(a)



(b)



(c)

Fig.2: The system applications

The WebSigner (a) can be used for aiding deaf person to obtain information from Internet using his convention way. The TVSigner (b) can generate virtual signer for TV that aids deaf person to watch TV. The OnlineSigner (c) can be used for Chinese sign language learning, which allows you learn standard Chinese sign language in a short time.