SECTION V
Using Technology

Bridging the Digital Divide for Deaf and Hard of Hearing Students: Sign Language 3D Animation Software Authoring Tool

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Abstract

Computer graphical interfaces and text presented in software programs and on Internet Web Pages are part of the visual modality. However, this does not mean that, in being visual, these are equally accessible for deaf and hard of hearing people. Many deaf and hard of hearing individuals prefer communication presented in some variant of American Sign Language (ASL), their first language, and may choose if given the option, ASL-English interpreter services over English text captioning. SigningAvatar™ technology uses computer-generated 3D animated characters that can communicate in variants of ASL. This presentation demonstrated the SigningAvatar™ Authoring Tool software program, which allows users to rapidly create sign-enabled content to increase access of deaf and hard of hearing children and adults to digitally-based information.

Computer graphical interfaces, text and images presented in software programs and on Internet Web Pages are all part of the visual modality. However, this does not mean that, in being visual, these are equally accessible for deaf and hard of hearing students. Many deaf and hard of hearing individuals in the United States prefer communication presented in some variant of American Sign Language (ASL), their first language, and may choose if given the option, ASL-English interpreter services over English text captioning, or ideally both.

SigningAvatar™ technology uses computer-generated three-dimensional (3D) animated characters that can communicate in variants of ASL, to provide access and increase English literacy for deaf and hard of hearing individuals. The SigningAvatar™ Authoring Tool will allow individuals to rapidly create SigningAvatar™ scripts for creating sign-enabled content. The Authoring Tool provides the user with the ability to either import text from another document or to directly type in English sentences. The Authoring Tool will semi-automatically transliterate and disambiguate imported English text into English-like ASL. For some situations transliterated content is sufficient for effective communication and access depending on the preferences and needs of the consumers viewing the content.

If the goal of the signed content is grammatical ASL, the Authoring Tool provides an interface to edit the transliteration. The interface layout is designed to be non-linear, meaning that you can insert, copy, move, paste and delete the content at any point without having to re-enter it (much like using a word-processor vs. a typewriter). There are many other features included that assist the user in refining the signed content. Using some of these features will allow the user to make the following grammatical changes:

- Use of grammatical ASL facial expression
- Use of grammatical eye gaze
- Omission of articles, prepositions and “to be” verbs
- Emphasis in the form of change in speed, or holding of a sign
- Use of signs that help organize a list of objects or persons using the fingers of the non-dominant hand
- Modified sentence structure (e.g., subject-verb-object to object-subject-verb).

Plans for future development include graphical tools that will allow the user to spatially inflect signs. The resulting sign language animation can then be easily exported in an HTML file for publishing on the Internet or CD-ROM software.

This technology will increase access of deaf and hard of hearing children and adults to digitally-based information and promote inclusive education and employment approaches which accords with the language and intent of the New Freedom Initiative, recent amendments to Section 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act, and Section 255 of the Telecommunications Act, and, thus, will have broad societal benefits.

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