



Context

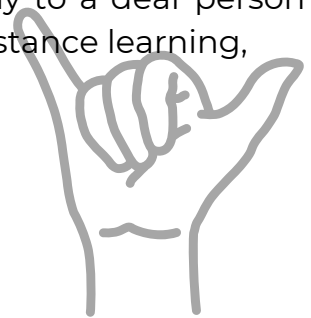
Sign Language (SL) is often used and preferred by deaf-signing students to communicate. In a great majority of cases a deaf-born person can learn how to read and speak oral language following speech-therapy.

Reading is a complex process for the Deaf as a deaf-born person has no experience of the sound of words, these must be studied and practiced for a long time to be able to recognize them.

Sign language is way easier and clearer mean of communication within the Deaf culture. Understanding written and oral language permits anyway to a deaf person to follow oral speech by lipreading or by subtitles on screen during distance learning, permitting inclusion to the lesson topics.

Software capable of translating directly to sign language would mean a great help to social inclusion of deaf people, and it is currently matter of research and development.

Meanwhile, automatic subtitling is a preferable alternative.



3D animation and Sign Language

Assistive technology is trying to create software capable of producing sign language through an animated avatar. Unfortunately automatic 3d animation is still not capable of replicating hand movements and facial expressions in the accurate way needed to create an actual speech in SL, unless the animation is scripted as in movies.



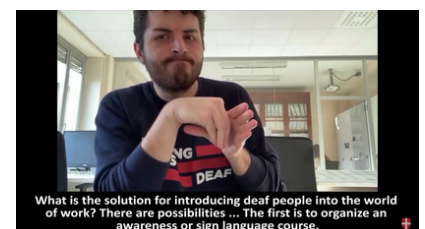
Facial and body expression are key components of sign language and this is currently a poorly accurated aspect of the 3d animation implied in language translation; deaf students usually prefer to read subtitles or have a live translator instead of a digital avatar.



Adaptation

3d simulation capable of live-translating in sign language would mean a great jump ahead in assistive technology and would represent an even greater chance of social inclusion for the deaf in everyday life and in the education field.

Nowadays during online learning the best a teacher can do to include deaf students is to use **automatic subtitling** software and try to speak as clearly as possible, as its technology can easily slip on words and create different meanings from the original sentence.





The use of facial expressions in Sign Languages

The complexity of facial expressions and body communication is extended, their use and value varies in different cultures and can have a strong influence on communication.



Facial expressions are a key component of SLs, just like grammar, syntax and punctuation for oral languages. These give direct clues to who's following for context, emotions and tones of a conversation.

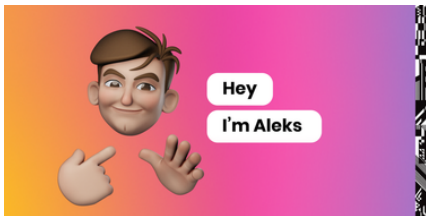
Recent studies suggest that facial expressions may be added to the 4 parameters that compose every sign (word) of sign languages: hand configuration, orientation, movement and space.

Motion capture technology is exploited to record this kind of small and subtle facial movements.

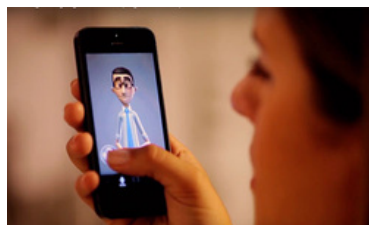


Example

Some examples of existing animated avatars:



"Aleks", GiffGaff from British TV.



"Hugo", HandTalk from Brazil.



"Bu Hamad", Mada from Qatar.



"Simax", from Europe.



Resources

To learn more about this topics you can read Rosalee Wolfe's paper: **Special issue: recent advances in sign language translation and avatar technology**, published by Universal Access Society; or K. Jaballah's : **A Review on 3D Signing Avatars: Benefits, Uses and Challenges**, published on International Journal of Multimedia Data Engineering and Management or directly look for 3d avatar existing nowadays, like Simax for American Sign Language.