

# Sign Printing System - SignPS

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## Abstract

The development of the Sign Printing System (SignPS) is based on the need of a way for sign language users and teachers to compose pictures of signs without having considerable drawing skills, to store these pictures into a database and to retrieve them at wish for several purposes. The sign pictures are abstract but nevertheless recognizable without specific training. The programme is not developed for scientific purposes, but for use by the general (signing) public.

## 1. 'Drawing' sign pictures

Similar to languages, sign languages often require a static representation, that can be used in print and processed in one's own pace. Currently, several types of static representations:

photographs, drawings, glosses and several notation systems are used to represent single signs, sometimes also for the representation of sign sequences. The reason for yet another system is that the existing systems have several disadvantages, that are overcome by Sign PS

Glosses, first have the disadvantage of not giving information on the shape of a sign. Second, since glosses are labels taken from spoken languages, whose grammatical structure is often considerably different from the sign language, much of the information that is present in a sign cannot be expressed by words or affixes of these spoken languages. Various subscripts and superscripts are then needed to represent this information.

Disadvantages of photographs and many drawings are the unnecessary details they show (clothes, hairstyles), that can distract the onlooker from the message. Photographs show particular persons, drawings have particular styles. As a result it is seldom possible to use separate photographs and drawings to construct

coherent representations of sign strings. Furthermore, most people's drawing skills are not sufficient to make drawings of signs, and photographs require special equipment and additional adaptations in order to represent the dynamic part of signs (such as the movement of the hands).

Thirdly, although most notation systems (e.g. SignWriting, HamNoSys, KOMVA) do not entail these problems, they are not userfriendly for common language users in general, because special training is needed to learn to use them, and, more importantly, in some groups of sign language users there is a general resistance against the use of such systems for common use.

The Sign Printing System overcomes these problems by offering everyone with basic sign language skills a tool for quick and easy construction of sign pictures. The program opens with the contours of the head and shoulders of a signer. Handshapes can be chosen from a limited set of

handshapes and added to the picture. These can be moved, copied, rotated or mirrored into the desired

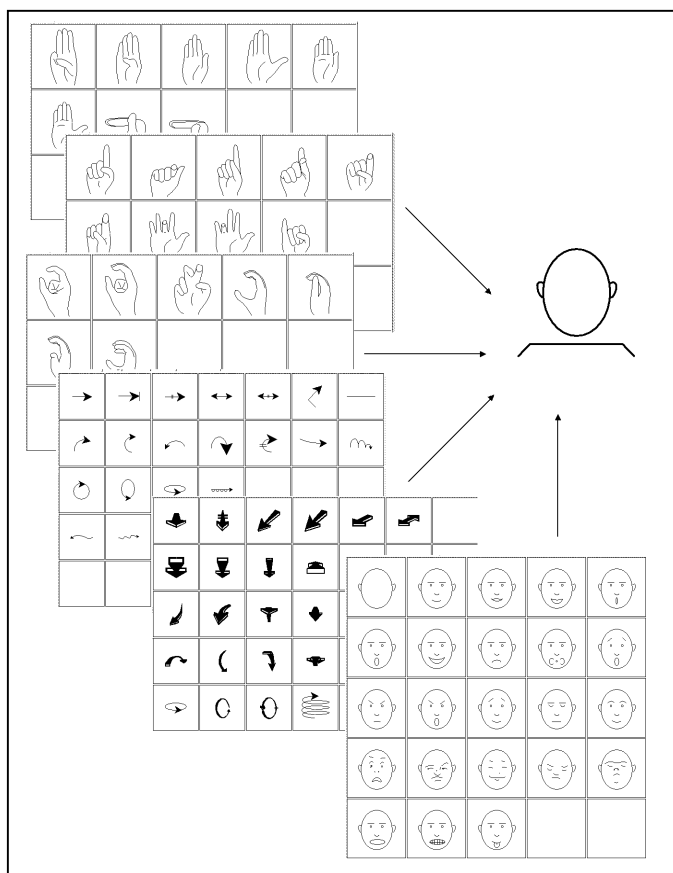


Figure 1 Components from restricted sets can be added to a sign picture.

orientation. In the same way, arrows and other movement symbols can be chosen from limited sets, added to the picture and edited. Furthermore, particular facial expressions are composed by choosing and/or editing face components: eyes, eyebrows, mouth and nose. Subsets of these sign components are shown in Figure 1.

3-Dimensionality is suggested by 3-dimensional movement block arrows for movements towards and away from the signer and by varying the size of the hands. A large-sized hand gives the impression that it is closer to the onlooker than a small-sized one, as illustrated in Figure 2.

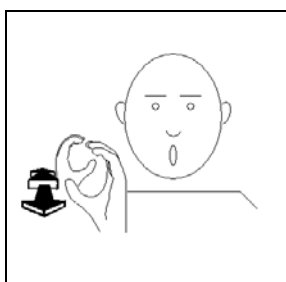


Figure 2 3-dimensionality in a 2-dimensional picture (NGT sign for 'tube on shoulder')

These sign pictures are rather abstract in that they only contain the minimal number of components necessary for understanding the sign. Because of this abstraction, they can also be easily combined to form sign strings. On the other hand, the abstraction in the sign pictures is not so extreme that special training is required for learning to recognize the signs.

At present, the Sign Printing System contains the sign components needed for signs from Sign Language of the Netherlands (henceforth: NGT). It will be fairly easy for the developers to make adaptations for other sign languages (such as different sets of handshapes).

## 2. Storage and retrieval

The Sign Printing System has in common with photographs and drawings that the sign pictures are stored as whole units. Once stored, a user can retrieve the sign pictures as whole units and does not need to compose a particular sign picture anew every time it is needed.

An innovative part of the Sign Printing System is the database. A sign picture that is stored in the database must be connected to a concept and to a gloss. In case of synonymic signs, it is possible to connect more than one sign picture to one concept (and one gloss). For instance, NGT has several synonymic signs meaning 'good' that can all be stored with the same gloss. This facilitates retrieval, since synonyms will not be overlooked. A sign picture can also be connected to more than one gloss (depending on the language from which the gloss stems). For instance, NGT has only one sign meaning 'cat', whereas Dutch has two words with that meaning, *kat* and *poes*. The sign picture can be thus labelled with both glosses, but still be stored as one picture. A number of concepts are present in the database from the start. They are ordered in a semantic

hierarchy. Although it is not possible to change the database structure, a user can add concepts and glosses to the database and even add categories to the semantic structure.

Retrieval of sign pictures is possible in three ways. First, the database can be searched by gloss name, which is a common way for retrieval in many sign databases. Second, a user can search for sign pictures within the hierarchically structured semantic fields in the database. By choosing a particular semantic field, the user is shown the subset of the gloss names of the signs that are in this field in the database. This is illustrated in Figure 3.

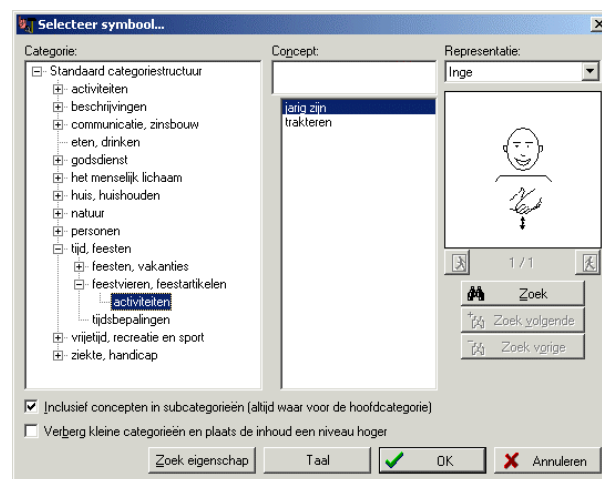


Figure 3 Searching within the semantic field of 'celebration activities'

Third, a user can search sign pictures by selecting components of the signs, viz. handshape(s) and/or place of articulation. For instance, in Figure 4 the results are shown of a search operation for a sign with a particular handshape that is made in front of the chest. The particular orientations of handshapes in signs is not taken into account in the handshape search facility.)

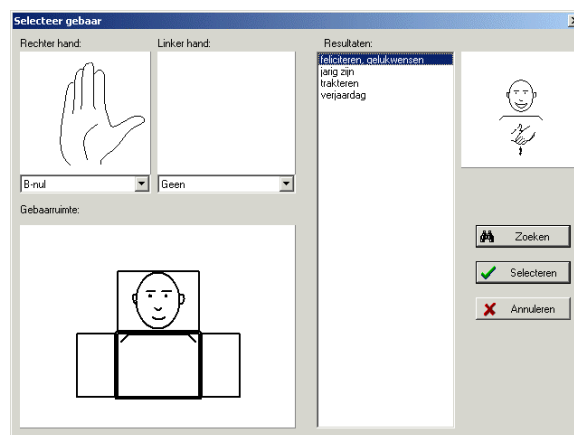


Figure 4 Searching by sign components

## 3. Use of the sign pictures

The Sign Printing System is part of a range of software applications using communication symbols and

databases (sharing the same format) holding these symbols (such as Bliss, PCS and Picture this), called Symbol for Windows™. Among the applications are a plain word processor, an email program and several educational tools. The sign pictures stored in the database of the Sign Printing System can be used directly in these applications. Retrieval of these pictures is fast, and additionally, other elements (pictures, photographs or symbols) can be retrieved from the connected databases and used in the same application. For instance, one can combine the picture of the sign for 'cat' with a picture of a cat, and/or with the Dutch word *kat*. The combined use of sign pictures and a photograph is illustrated in an item of a multiple choice test in Figure 5.

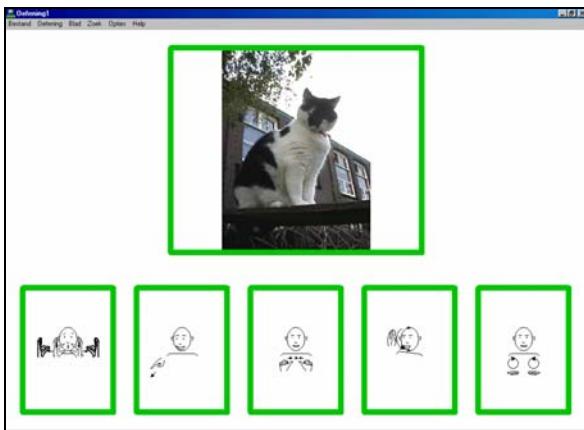


Figure 5 Multiple choice test for NGT idiom with SignPS pictures

Common Windows programs do not have direct access to the databases. The sign pictures can be retrieved from the database and stored as graphic files with an export tool that is included in Symbol for Windows. These pictures can easily be inserted in applications such as Word or Powerpoint. The sign pictures can also be cut and pasted into these applications. An example of a lecture using an NGT sentence is shown in Figure 6.

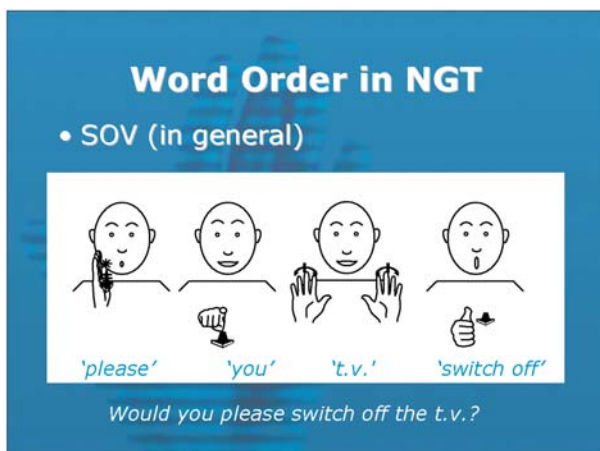


Figure 6 Powerpoint presentation with SignPS pictures

#### 4. Further developments

The Sign Printing System is still under development. It has not yet been used and tested by large user groups. A first working version is distributed and a pilot course in the use of the program has recently been taught to a small user group (NGT teachers and speech therapists at Viataal). This group currently evaluates the program and their first reactions are very positive. A preliminary inventory of desirable adaptations shows that the set of viewing angles of handshapes should be extended and that the user-friendliness needs to be slightly improved.