A Computer Dictionary with animated Signs for the Special Field of Computer Technology

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Abstract

A specialized sign dictionary on computer technology containing about 1,700 terms is currently being developed as part of a project financed by the Federal Ministry of Labour and Social Welfare. It is to be published as a manual and computer dictionary with animated signs, and also as a videotape course.

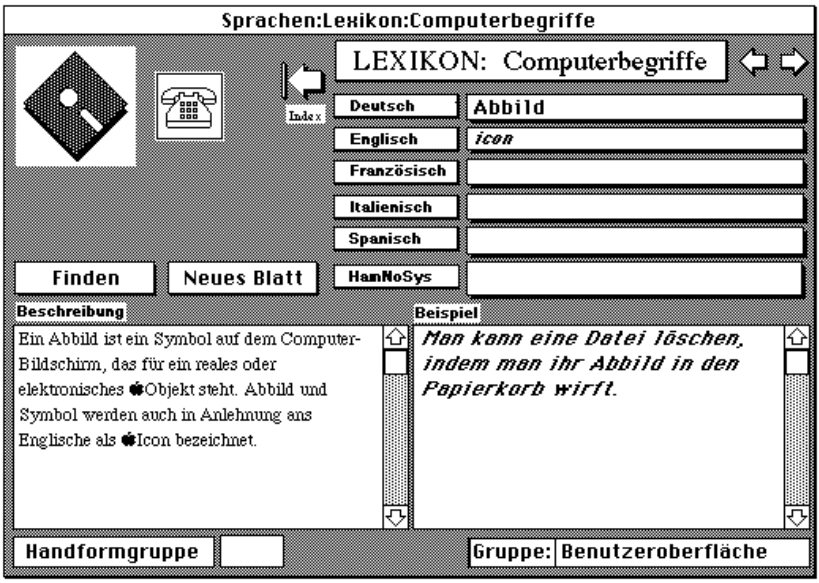
Selected signs are being surveyed within a nationwide group of deaf computer experts on the basis of a manual which explains these terms. The result of this work allows for comprehensive findings on the various principles for the generation of new signs in German Sign Language from a linguistic point of view. The development of a specialized computer dictionary on this field is also meant to try new ways of conceptualising the technology and contents of sign dictionaries. While the majority of sign dictionaries so far have offered a mere comparison of word and sign the model of the dictionary to be presented opens up a variety of opportunities.

- The terms of the dictionary are grouped according to subject areas; when a group term is selected, all appertaining technical terms will be presented
- There will be explanations of each term with references to other terms,
- definitions will be followed by verbal illustrations which show the typical use of a technical term in context,
- there will be illustrative pictorial, graphic and dynamic-visual information
- signs will be presented as animated sign drawings, the respective handshapes can be viewed as close-ups
- the technical terms will be presented in several foreign languages,
- The whole dictionary is an 'open' dictionary; it can thus be changed, restructured, complemented and modified by any of its users at any time.
- Print-outs may contain the data drawings, and the displayed on the screen.

Following the presentation, explanation and demonstration of this model of a computer dictionary with signs I want to reflect the structures of elaborated future dictionaries for sign languages.

1. Programming the Dictionary

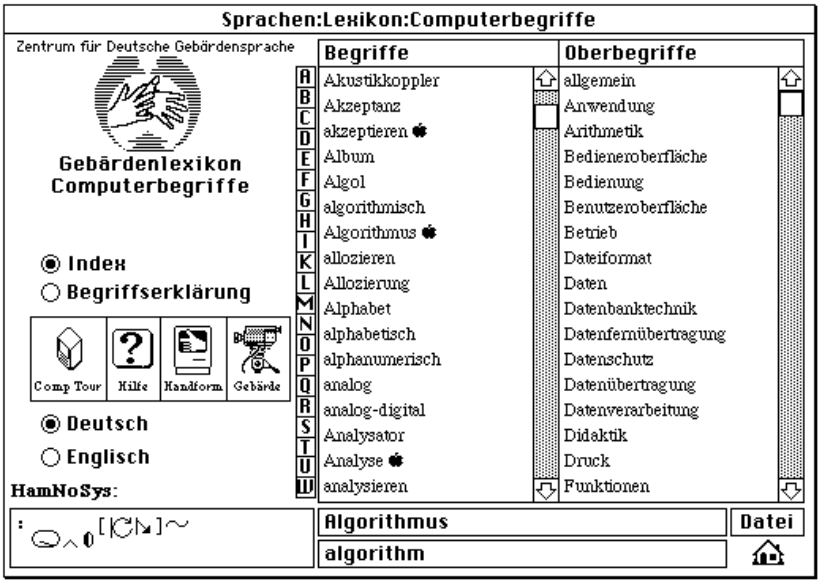
The program structure of the dictionary is basically that of a databank. The records consist of simple "cards" alphabetically sorted which might be reached by "browsing". The picture below demonstrates how this card looks like. Here you may enter terms in different languages, and an explanation of the term, and an example or a sentence illustrating the term. Each term falls in one of several group categories, and the card contains the transcription of the corresponding sign as well as a code for the handform to which the sign belongs.

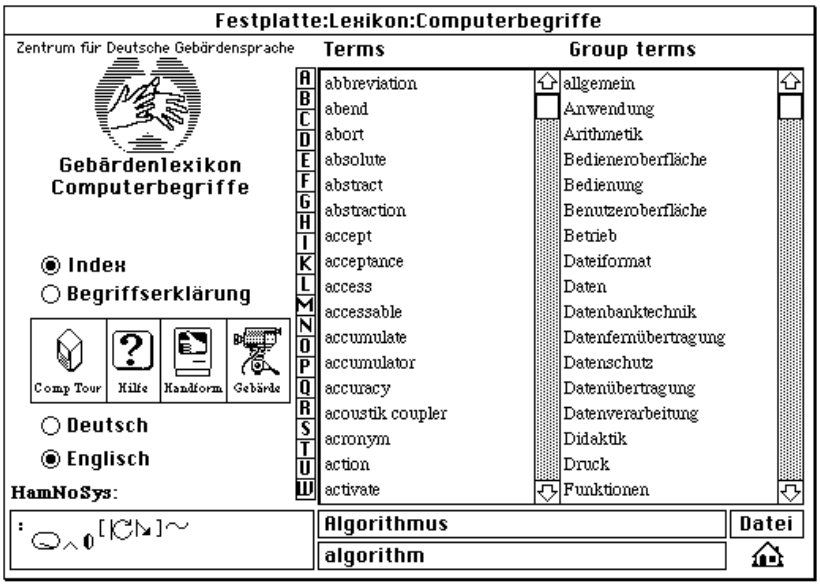


Regarding the user interface, we decided not to let the user see the single records or cards unless he wants to enter a new term. But we have designed a special user interface which uses a single main card which contains most of the functions the user needs.

On this main card there appear scrolling lists with

a. the terms which have been entered as single records into the database
b. categories used to classify and sort the terms into several groups, e.g. hardware, software, system, peripherals etc.
c. further lists each with a special selection of terms which the user himself has constructed, e.g. a selection of terms for beginners, for a special course etc.

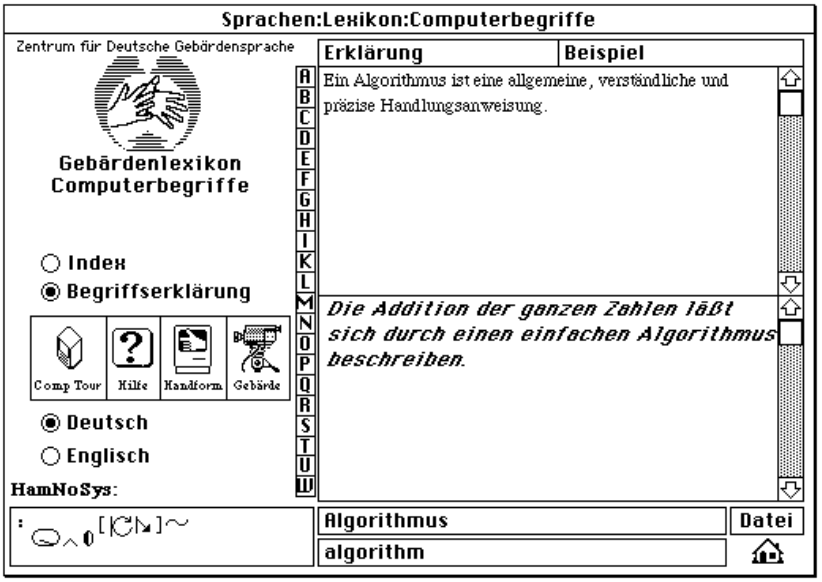




On the same card or screen all other functions of the dictionary take place:

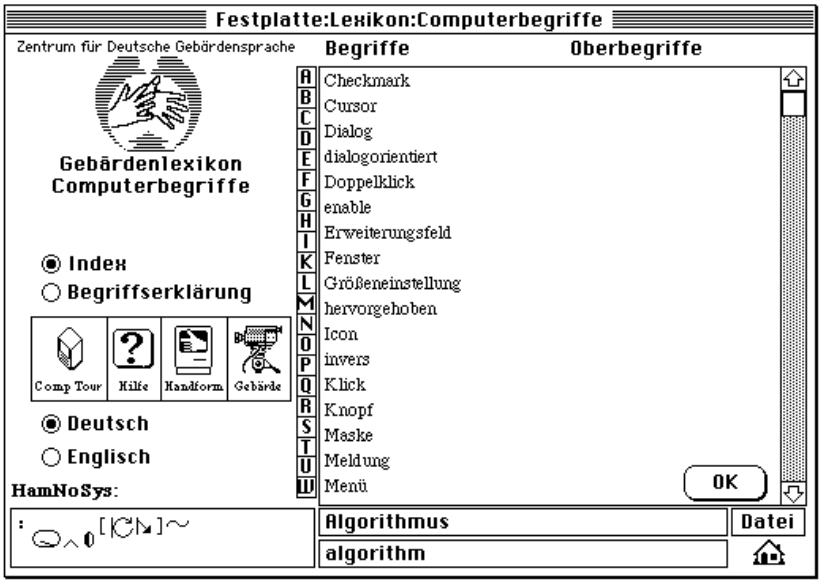
d. the film of the selected sign is shown here,

e. the picture of the corresponding handform for the sign may be looked up here,



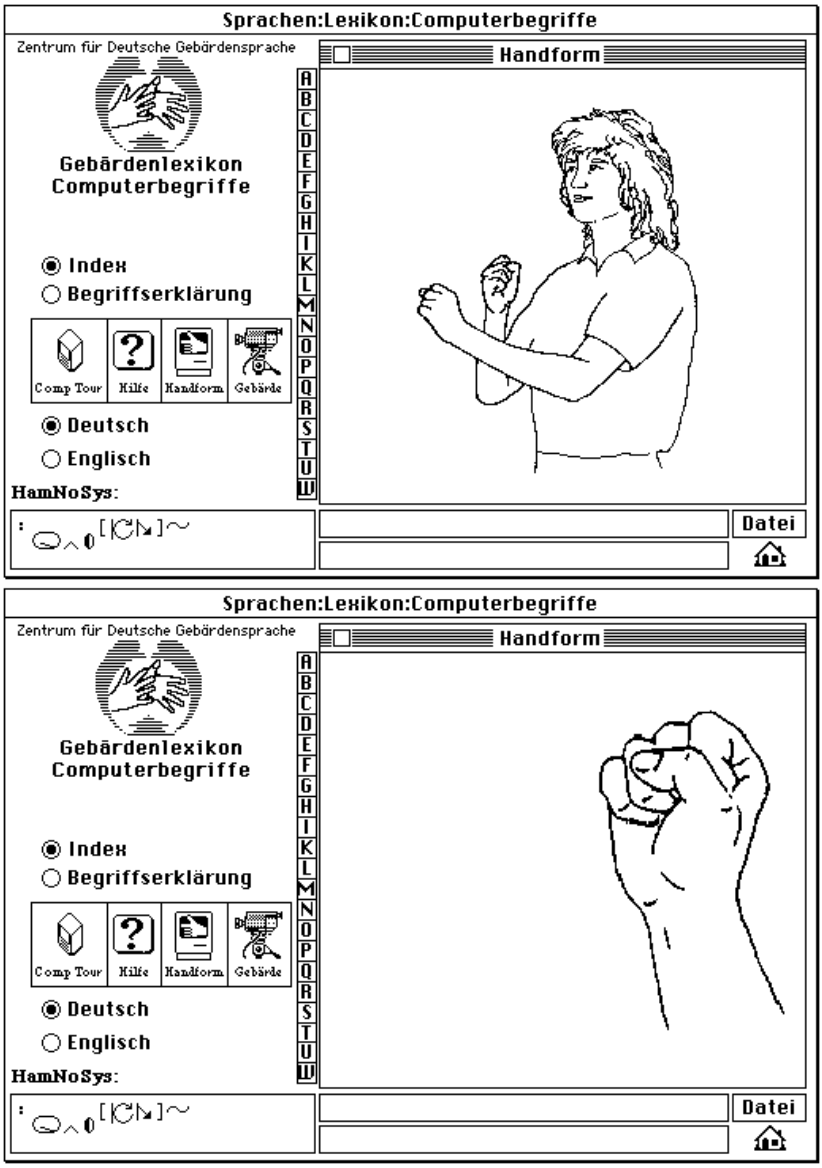
After selecting a term appear two fields with an explanation and an example

f. a picture for the selected term may be shown here if the term represents an object (e.g. processor, printer, network etc.)



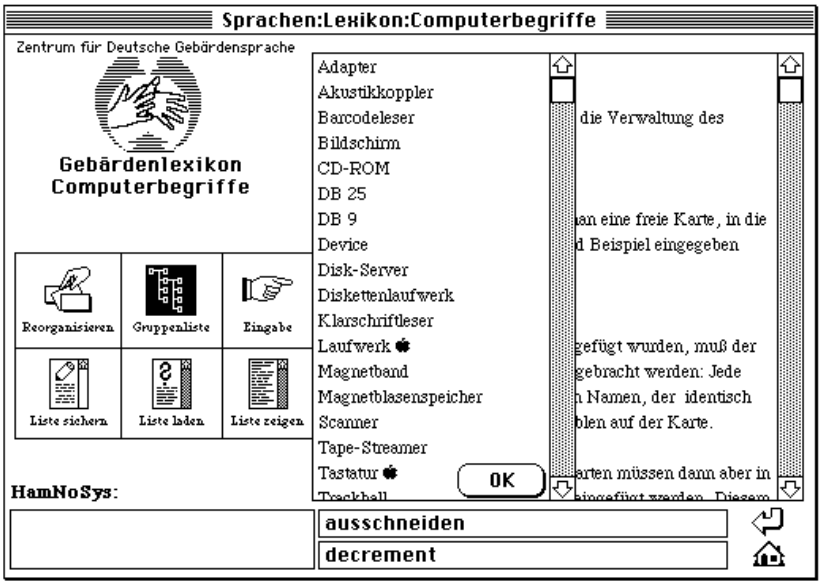
A group category was selected: It appears a list with all records grouped into this category

The dictionary may be used by selecting the German as well as the English term which in many cases represents the historic original.



We have chosen the general purpose application HyperCard™ as programming tool because it allows rapid and relatively easy prototyping, provides the developer

with a simple kind of database, and is able to integrate pictures and animations, and because it is owned by every Macintosh user.



Card for the organisation of the dictionary as a database:
You may choose to insert new cards, reorganize the database (scrolling lists and sorting), write a selection of specific terms or records into a new scrolling list.

Signs are transcribed in the database according to the grammar concept inherent in HamNoSys. In order to insert HamNoSys transcribed sign language strings into the database we shall be able to use the HamNoSys-Editor in future which is being developed also as a HyperCard application.

Animated signs or movies of signs which may be run in the dictionary might in future be generated by H.AN.D.S., saved as a film document, and opened again in the dictionary. All three programs are compatible in their respective data and file formats and are designed to work together.

2. Didactics of Dictionary Concepts

Most of the dictionaries or encyclopedias we know are organised in a flat or linear structure. Hierarchically or complex structured dictionaaries are very seldom. Linear dictionaries organise their contents in flat form as an alphabetical sequence of terms and explanations. As most of them have been printed as books they generally had no alternative to this sequential order.

A technique of indexing the contents of a dictionary or linking terms across the alphabetical sequence and on several hierarchical levels is very difficult to achieve in a printed book (and rather tedious to use). The computer however offers new opportunities: A limitless number of text samples or terms might searched for. Explicitely as key words or indexes installed text locations are only prefabricated routines to make searching more comfortable for the user. The terms you are looking for might even not represent the same logical or semantic level, they might represent different hierarchical levels of a semantic net or tree structure. Nevertheless they may appear to the user in form of a list of words.

Thus the material or factual relations which constitute the subject of a dictionary might be conceptualized in a much better form. These principles must also be constituent for the user interface: The user must be able to „jump" from one place to another and always return to the starting point. The user must be able to jump horizontolly and vertically through the database. It must be possible to produce selections of all available records at any moment.

A dictionary should integrate text and picture informations. And even pictures must be connected with verbal keys. Terms which designate objects or visual information will be illustratrated with pictures (e.g. processor, ROM, RAM, printer, network etc.)

One of the most important aspects of a dictionary is how understandable its information will be especially the explanative parts of it. Understanding is very much related to the receiver of a message, and a dictionary might have different users: At the moment we are modifying the texts and trying to observe the following principles:

- the scientific part of explanations should be correct even if it is hard to understand, but we do not believe in substituting popularized incorrect statements. Correct definitions are important for more experienced users;
- explanations should be accompanied by everyday circumscriptions in order to be understandable for beginners also. A certain degree of redundance should be built into these explanations.

In order to enhance the usability of the dictionary for different purposes we have provided a function which allows the user, for instance a teacher, to generate scrolling lists with his/her own selection of terms by simply clicking on a term with the cursor. Thus the user may built lists with terms, e.g. for a certain course, for a presentation, for a specific group of poeple like pupils, beginners, advanced, professionals etc.

3. Linguistic Aspects of a Computer Dictionary

A database registering also sign language terms is confronted with the most advanced aspects of linguistic research which are not as easy to solve as the programming of the database itself.

A major problem is the selection of the dictionary terms and the method of categorizing the terms. Not only terms should be selected which are known as being related to computer usage. To a certain degree also general, everydaylife terms should be selected, because they experience a semantic shift if used in connection with computers. We should aim to register the semantic context in a very complex way in order to improve a competent use of language in conjunction with computer work.

Concerning sign language, we adopted the principle to register those signs which originated in the language community of those deaf who are daily working or teaching with computers. A research group was formed of deaf persons who are professionaly working with computers in educational institutions. This group convenes regularly, collects and describes all known signs. The signs and their explanations are recorded on video, subsequently evaluated and transcribed in HamNoSys.

The dictionary is developed in cooperation with institutions for the professional vocation of the deaf. This is especially helpful in regard to the selection of the terms.

Another problem is that for some computer terms there do not exist eqivalents in sign language. New sign might be formed by

a. borrowing signs from other sign languages especially the American Sign Language (ASL)

b. generating signs in analogy to known linguistic generic principles (e.g., “compound” signs).

A computerised dictionary on the other hand has some advantages for linguistic research on sign language: The dictionary enables us to search for transcribed sign, i.e. for HamNoSys strings. After having filled the database with transcriptions we shall thus for the first time in linguistic research be able to investigate how often a

specific handshape occurs within the database and in which signs, how often a specific movement is used and in which signs, how often a certain handshape is combined with a certain movement etc. Thus a relatively simple statistical survey in sign language will easily be possible.