



## **SIGNSPEAK**

**Scientific understanding and vision-based technological development for continuous sign language recognition and translation**

Grant Agreement Number 231424

**Small or medium-scale focused research project (STREP) FP7-ICT-2007-3. Cognitive Systems, Interaction, Robotics**

Project start date: 1 April 2009

Project duration: 36 months

**Deliverable D.1.7:** Enriched annotation documents for the existing CNGT corpus containing a marking of selected non- manual activity

Dissemination Level: **Public**

**Date:** 31 March 2011

**Version:** 1

**Author:** Onno Crasborn  
Centre for Language Studies  
Radboud University Nijmegen

## 1. Introduction

This document describes the nonmanual annotations that were made for SignSpeak, consisting of headshakes. We refer to the documentation for D1.5 for a description of the nature of the annotation files and how they can be viewed. The annotations themselves are included in (many of) the annotation documents (ELAN files) that are jointly part of D1.5 and D1.7. The files that do include headshake annotations are also delivered separately in the file `SS_D1.7_headshakes.zip`. These files belong to the open access part of the Corpus NGT, and are therefore included in this public deliverable. Eleven additional files that have been annotated for headshakes may not be publicly distributed, and are not formally part of this deliverable. They are included in the supplementary file `SS_wholeCNGTplusnewrecordings.zip`, which may be used only for project-internal purposes.

Appendix 1 presents an overview of the files that have been annotated for headshakes.

Headshakes were chosen out of the large array of possible non-manual features active in deaf communication as they appear to have a clear semantic function: they are always related to negation in some form or other. Moreover, they are relatively easy to annotate for the partner EUD (having no specific knowledge of NGT). Finally, the negative semantics has an important and relatively comprehensive influence on the translations that are the target of SignSpeak's WP5.

The 82 files with headshake annotations contained a total of 2390 sentences that can now receive a more accurate translation.

Finally, please note that while the sentence boundaries have been especially created to contain all the gloss annotations for the sentence, the headshake annotations have been made 'phonetically' afterwards: the actual full time domain of the head movement is marked with an annotation, sometimes extending over sentence boundaries.

## 2. Conventions for annotating headshakes

The annotations are on the tiers `Head movement S1` and `Head movement S2`, for the left and right signer in view, respectively. Both the signer and the addressee have been annotated. Doubtful cases were preceded by a question mark (n=80). The table below presents the distinctions that were made in the annotation process.

A primary distinction is made between headshakes (primary rotation about vertical axis) and head sways (primary rotation about front-back axis). There are no studies in the linguistic literature about these head sways, but in the videos that were annotated, but they appeared to express negation more often than not (35 vs. 23 cases) in the present data set. Sways of the head can also be the result of or cooccur with body sways; if the head also moves, then it was annotated as `Ns` or `Nsx`, but not if only the upper body moved while the head remained stable with respect to the torso.

In contrast to head sways, head shakes were overwhelmingly related to negation (690 vs. 22).

**Table 1: head movement codes and frequencies in the data**

Code	Description	Frequency	Doubtful cases
N	Headshake expressing negation, cooccurring with manual signs	690	56
Nx	Headshake expressing negation, falling in between two manual signs	116	7
Nf	Headshake expressing negation, not cooccurring with manual signs (i.e., esp. of the addressee)	287	12
Nn	Headshake not expressing negation, cooccurring with manual signs	22	3
Ns	Head sway from side to side expressing negation	35	1
Nsx	Head sway from side to side not expressing negation	22	1

### **Appendix 1: overview of annotated files**

See following two pages.

Seesion	Duration	Left signer	Right signer	Sentence annotation	Content	Public	Head	SS subset
0004	0:05:37	S003	S004	None	Private situation	Yes	Yes	No
0055	0:01:41	S006	S005	Translations	Discussion	Yes	Yes	Yes
0056	0:02:00	S006	S005	Translations	Discussion	Yes	Yes	Yes
0057	0:01:19	S006	S005	Translations	Discussion	Yes	Yes	Yes
0058	0:06:09	S006	S005	Translations	Discussion	Yes	Yes	Yes
0059	0:01:17	S006	S005	Translations	Discussion	Yes	Yes	Yes
0060	0:03:41	S006	S005	Translations	Discussion	Yes	Yes	Yes
0061	0:01:07	S006	S005	Translations	Discussion	Yes	Yes	Yes
0062	0:02:01	S006	S005	Translations	Discussion	Yes	Yes	Yes
0063	0:04:01	S006	S005	Translations	Discussion	Yes	Yes	Yes
0064	0:02:17	S006	S005	Translations	Discussion	Yes	Yes	Yes
0065	0:01:56	S006	S005	Translations	Discussion	Yes	Yes	Yes
0066	0:00:57	S006	S005	Translations	Discussion	Yes	Yes	Yes
0067	0:04:40	S006	S005	Translations	Discussion	Yes	Yes	Yes
0068	0:03:09	S006	S005	Translations	Discussion	Yes	Yes	Yes
0069	0:03:06	S006	S005	Translations	Discussion	Yes	Yes	Yes
0253	0:10:14	S013	S014	Sentence units	Discussion	Yes	Yes	Yes
0254	0:09:11	S013	S014	Sentence units	Discussion	Yes	Yes	Yes
0255	0:07:12	S013	S014	Sentence units	Discussion	Yes	Yes	Yes
0256	0:08:51	S013	S014	Sentence units	Discussion	Yes	Yes	Yes
0258	0:02:51	S013	S014	Translations	Discussion	Yes	Yes	Yes
0259	0:04:51	S013	S014	Translations	Discussion	Yes	Yes	Yes
0338	0:02:43	S016	S015	Translations	Discussion	Yes	Yes	No
0339	0:01:58	S016	S015	Translations	Discussion	Yes	Yes	No
0386	0:03:36	S020	S019	Translations	Discussion	Yes	Yes	Yes
0387	0:01:58	S020	S019	Translations	Discussion	Yes	Yes	Yes
0388	0:03:42	S020	S019	Sentence units	Discussion	Yes	Yes	Yes
0389	0:00:49	S020	S019	Sentence units	Discussion	Yes	Yes	Yes
0390	0:02:12	S020	S019	Sentence units	Discussion	Yes	Yes	Yes
0427	0:02:17	S021	S022	Translations	Discussion	Yes	Yes	Yes
0428	0:02:44	S021	S022	Translations	Discussion	Yes	Yes	Yes
0429	0:03:22	S021	S022	Translations	Discussion	Yes	Yes	Yes
0430	0:03:36	S021	S022	Translations	Discussion	Yes	Yes	Yes
0431	0:01:52	S021	S022	Translations	Discussion	Yes	Yes	Yes
0432	0:01:28	S021	S022	Translations	Discussion	Yes	Yes	Yes
0434	0:02:20	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0435	0:04:35	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0436	0:01:46	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0437	0:04:34	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0438	0:02:40	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0439	0:02:14	S021	S022	Sentence units	Discussion	Yes	Yes	Yes
0476	0:02:57	S023	S024	Translations	Discussion	Yes	Yes	Yes
0485	0:01:28	S023	S024	Translations	Discussion	Yes	Yes	Yes
0486	0:04:23	S023	S024	Sentence units	Discussion	Yes	Yes	Yes
0487	0:02:35	S023	S024	Sentence units	Discussion	Yes	Yes	Yes
0488	0:01:25	S023	S024	Sentence units	Discussion	Yes	Yes	Yes
0489	0:04:51	S023	S024	Sentence units	Discussion	Yes	Yes	Yes
0529	0:05:21	S026	S025	Translations	Discussion	Yes	Yes	Yes
0531	0:02:40	S026	S025	Translations	Discussion	Yes	Yes	Yes
0532	0:05:00	S026	S025	Sentence units	Discussion	Yes	Yes	Yes
0534	0:02:58	S026	S025	Translations	Discussion	Yes	Yes	Yes
0536	0:06:12	S026	S025	Sentence units	Discussion	Yes	Yes	Yes
0537	0:00:14	S026	S025	Sentence units	Discussion	Yes	Yes	Yes
0538	0:02:10	S026	S025	Sentence units	Discussion	Yes	Yes	Yes
0539	0:04:28	S026	S025	Sentence units	Discussion	Yes	Yes	Yes
0557	0:00:53	S027	S028	Sentence units	Discussion	Yes	Yes	Yes
0564	0:01:05	S027	S028	Translations	Discussion	Yes	Yes	Yes
0567	0:01:02	S027	S028	Sentence units	Discussion	Yes	Yes	Yes

# Corpus NGT: public files with headshake annotations

31-03-11

0616	0:02:03	S030	S029 Translations	Discussion	Yes	Yes	Yes
0617	0:01:21	S030	S029 Sentence units	Discussion	Yes	Yes	Yes
0618	0:03:51	S030	S029 Sentence units	Discussion	Yes	Yes	Yes
0620	0:01:00	S030	S029 Sentence units	Discussion	Yes	Yes	Yes
0714	0:02:28	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0715	0:05:18	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0722	0:02:26	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0723	0:03:09	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0724	0:00:34	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0725	0:00:46	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0726	0:06:18	S034	S033 Sentence units	Discussion	Yes	Yes	Yes
0814	0:04:12	S035	S036 Translations	Discussion	Yes	Yes	Yes
0821	0:06:11	S035	S036 Sentence units	Discussion	Yes	Yes	Yes
0822	0:04:58	S035	S036 Sentence units	Discussion	Yes	Yes	Yes
0824	0:02:30	S035	S036 Sentence units	Discussion	Yes	Yes	Yes
0857	0:02:31	S040	S039 Sentence units	Discussion	Yes	Yes	Yes
0858	0:01:43	S040	S039 Sentence units	Discussion	Yes	Yes	Yes
0859	0:01:23	S040	S039 Sentence units	Discussion	Yes	Yes	Yes
0860	0:01:29	S040	S039 Translations	Discussion	Yes	Yes	Yes
0861	0:03:04	S040	S039 Sentence units	Discussion	Yes	Yes	Yes
1683	0:03:28	S069	S070 Sentence units	Discussion	Yes	Yes	Yes
1684	0:03:12	S069	S070 Sentence units	Discussion	Yes	Yes	Yes
1685	0:04:36	S069	S070 Sentence units	Discussion	Yes	Yes	Yes
1687	0:02:15	S069	S070 Sentence units	Discussion	Yes	Yes	Yes