The SignStream™ Project

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July 1997

1. Introduction

SignStream[*] is a multimedia database tool designed to facilitate video-based linguistic research. The project is a collaborative effort, involving researchers at Boston University, Dartmouth College, Gallaudet University, and Rutgers University. SignStream allows simultaneous on-screen access to digitized video data and to representations of those data in linguistically useful formats. SignStream provides a single computing environment for manipulating video and transcribing utterances by entering linguistic information in a variety of fields and then linking this information to specific frame sequences of the video, thus resulting in a fine-grained multi-level,

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temporally calibrated transcription. SignStream runs on MacOS systems and makes use of QuickTime video technology.

2. Background

Recently, linguists have begun to appreciate the importance of research on signed languages for understanding the human language capacity generally. Currently, however, linguistic research on signed languages, such as American Sign Language (ASL), is hampered by:

 • the amount of time and effort required to locate for study specific examples contained within a large collection of videotapes (even if they have all been carefully catalogued and transcribed); and

 • the difficulties involved in performing written transcriptions of video data (including annotations not only of manual signing—conventionally written in the form of English-based glosses—but also of simultaneously occurring, linguistically significant, non-manual expressions, drawn as labeled lines layered above the glosses) and searching through these transcriptions, without the benefit of computer-based tools to facilitate these tasks.

SignStream is being designed, in part, in response to such problems currently faced by linguistic researchers studying video-based language data.

Another major obstacle to progress in our understanding of signed languages is the lack of access by the scientific community to the data underlying specific (and often controversial) linguistic analyses reported in the literature. The inaccessibility of video data combined with the inadequacies of written representations has made it particularly difficult to resolve several fundamental disputes about data that are at the heart of major theoretical controversies. It is our hope that SignStream will make it possible for researchers to share their coded data, thereby advancing data-oriented scientific inquiry.

3. Potential applications

Although SignStream is being designed for analysis of American Sign Language, the tools provided can be used to study other signed languages, as well as the gestural component of spoken language. In fact, any linguistic research that relies on video data may benefit from the capabilities of SignStream.

In addition, SignStream may be of use in other types of applications, including computational linguistic research. For example, a large database of coded ASL utterances could provide an important source of information for computational analysis.

4. Overview of the program

A SignStream database consists of a number of utterances, where each utterance associates a segment of digitized video with a detailed transcription. Although the video and transcription are displayed in separate windows, the windows are linked in various ways to facilitate working with the two associated pieces of an utterance. For example, the video may be manipulated via controls in the transcription window. In addition, a vertical hairline indicator in the transcription window indicates the position within the transcription that corresponds to the current video frame; this indicator is draggable, allowing the user to reposition the video. The video and gloss windows are illustrated on the next page.

U2 Video – Sample Database

Gloss | 4650 ☒ | 100%▼

U2 Gloss – Sample Database

Video | Notes

Datum ▼ | Play Clip | |– | –| | – | + | | Set | Set | | – | +

Ben ▼ | Edit Profile | Hide Pane | Show Field | ● Primary

yes/no	_s_	y/n _e
eye brows	_s_	ra _e
head tilt		ht :for
main gloss	**fs–JOHN** **BUY** **HOUSE |>**	
nd hand gloss		
English	Is John buying a house?	

The transcription contains information entered into a variety of fields (e.g., gloss fields as well as fields for representing non-manual information). Data in the various fields are aligned visually on the screen to reflect their temporal relations. Data fields can be created and edited, as needed. This flexibility allows users to code a variety of types of data. Multiple conversational participants may be represented and viewed simultaneously in different panes within the transcription window. The screen display (color and arrangement of fields) can be configured by the user.

SignStream greatly simplifies the transcription process and increases the accuracy of transcriptions (by virtue of the link between linguistic events and video frames). In addition, SignStream enhances the researcher's ability to perform linguistic analyses and searches of various kinds.

5. Repository for SignStream databases

One goal of this project is to establish a large corpus of coded data, contributed by researchers using SignStream for a variety of different applications. We will establish a site on the Internet where data may be made publicly accessible.

6. Current status

As of this writing, an initial beta release is being distributed to a limited number of test sites. This release of the program does not contain full implementation of all features. For example, the program currently includes no search capabilities. Nonetheless, we have found the program to be a useful tool for coding and analyzing data. Any database files created with this and subsequent versions of SignStream will be upward-compatible; future versions of the program will be capable of reading database files created by an earlier version.

Additional areas of development include: search capabilities, design of fields specifically for representing phonological information and part of speech tagging, a tool for coding and analyzing spatial characteristics of visual-gestural language, a help facility, and printing and exporting of utterances.

7. Additional information

Further information is available from the following sources:

1. The SignStream Web site:

   http://web.bu.edu/ASLLRP/SignStream

2. MacLaughlin, D., C. Neidle, and R.G. Lee, Design Specifications for SignStream™, A Multimedia Database Tool for Language Research. *American Sign Language Linguistic Research Project, Report Number 3,* Boston University, Boston, MA, August 1996:

   http://web.bu.edu/ASLLRP/reports.html#RPT3

3. "The SignStream™ User's Guide":
   distributed with the SignStream program.

4. "Tips on Digitizing Video for Sign Language Research":

   http://web.bu.edu/ASLLRP/SignStream/video.html