Towards an Intuitive Sign Language Animation Authoring Environment For the Deaf

Alexis Heloir, Fabrizio Nunnari

UVHC, LAMIH - Valenciennes, France
DFKI-MMCI, SLSI group - Germany
**NLP: Parallel Corpora**

**Aligned annotated videos**

**Aligned Glosses**

**Glosses:** NACHMITTAG 5 GRAD LOC REGION NORD OSTSEE 10 GRAD FLUSS OBERRHEIN
**MT:** am tag 5 grad an der ostsee und bis zu 10 grad am oberrhein . [TER:0.0%]
**Ref:** Am tag 5 grad an der Ostsee und bis zu 10 Grad am Oberrhein .

**Eng-gl.:** AFTERNOON 5 DEGREES LOC REGION NORTH BALTIC 10 DEGREES RIVER UPPERRHINE
**English:** In the afternoon 5 degrees at the Baltic Sea and up to 10 degrees at the Upper-Rhine.

**Glosses:** TEMPERATUR NACHT SINKEN 11 NORDEN SEE 4 GRAD ALPEN
**MT:** in der nacht sinken die temperaturen auf 11 grad an der nordsee und 4 grad an den alpen . [TER:10.5%]
**Ref:** die temperaturen sinken in der nacht auf 11 grad an der nordsee und 4 grad an den alpen .

**Eng-gl.:** TEMPERATURE NIGHT DECREASE 11 NORTH SEA 4 DEGREES ALPS
**English:** The temperatures decrease at night to 11 degrees at the North Sea and 4 degrees at the Alps.

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**DictaSign Project (2009--2012)**

**RWTH-Phoenix corpus (2010)**
NLP: Corpora

Hand-crafting

ATLAS (2009--2011)

Motion capture

CUNY SL Corpus (2012)

SignCom System (2012)
SL Corpora

- Videos
- Motion capture
- Hand-crafted animation

- Manual annotation
Video

+ Easy to use and accessible

+ High fidelity

- Low semantics
Motion Capture

+ High fidelity
+ 3D plus numerical values
- Still Low semantics
-Cumbersome and expensive
Hand-crafted animation

+ More intelligible animation
+ Theory independent motion abstraction

- Expensive
- Requires both expert interpreters and 3D animators
Annotation

+ High semantic
+ Abstracted away
- Requires expert annotators
- Theory Dependent
SL corpuses

- Annotations
- Synthetic signs
- ???
- Hand-crafted animation
- Motion Capture
- Videos

Quantity of data

Abstraction

(Sign Writing, HamNoSys)
SL corpuses

- Annotations
- Synthetic signs
- Monitored handcrafted avatar animation
- Hand-crafted animation
- Motion Capture
- Videos

Quantity of data
Abstraction

(Sign Writing, HamNoSys)

NEW!
Production pipeline: to the user

- **mocap →**
  - Performance Capture
  - Data Cleanup
  - Sign animation Cleanup
  - Sign animation
  - Video Capture
  - Deaf user
  - **hand-craft →**

- **3D operator & Interpreter**
- **Signary**
- **Mocap operator**
- **3D operator**
Production pipeline: no complex 3D authoring

- Performance Capture
- Data Cleanup
- Sign animation Cleanup
- Deaf user
- Mocap operator
- 3D operator

mocap → Performance Capture → Data Cleanup → Sign animation Cleanup → Signary

Deaf user

hand-craft →
Production pipeline: NUIs and no specialized operators

- Performance Capture
- Data Cleanup
- Sign animation Cleanup

Deaf user

NUI !!!
Production pipeline: possibility to refine captured signs
New SL production pipelines

- Performance Capture
- Data Cleanup
- Manual Edit

Deaf user → Signary

Diagram showing the flow of data from performance capture to data cleanup, then manual edit, leading back to the signary.
Production pipeline at work

Video
Future: Gathering users’ intention

- LIS relevant info
  - Contacts
  - Time alignments
  - Gesture amplification
  - ...

Manual Edit

Edit history

Patterns extraction