Formalism for multi-linear rules of Sign Language grammars
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Proposition: A general description language for all synchronisation patterns in Sign Language
Motivation: Generalise observed sync patterns to build a new form of SL grammar, not limited to lexical boundaries

What is observed in a Sign Language annotation...

Arbitrarily complex patterns for synchronisation between time intervals (TIs) of signing

Example with enumeration: different productions (*)

For each item (repeatedly)

Head mvt: slowly moves fwd... | moves back
Signed item: enumerated item #n

For each item (repeatedly)

Head mvt: quick fwd | moves back
Signed item: enumerated item #n

What synchronisation in existing models?

Parametric [1] - All changes are in the “movement” parameter
- Separate non-manuals, sync with lexical segments only

Temporal [2] - Key-framed sync with (finer) parametric spec
- All transitions are between postures/detentions

P/C [3] - Good “phonetic” coverage
- Generalisation overconstrains

Arbitrarily complex patterns for synchronisation between time intervals (TIs) of signing

How to generalise into a production rule?

- Decide on the TIs where the signing activity is essential
- Establish a minimal set of time arrangement constraints to lay out the (likely overlapping) TIs on the timeline
- Specify the signing activity for each TI separately

On the example, invariants are:
- retraction of head lasts about .5s
- enumerated item ends while head is retracting

|head| = .5s, item| = |head - head|

Naming rules and nesting...

- Any TI can be specified by the use of a nested azalisting
- For example, encapsulating the classifier-pointing example (see left) in a head-shake negation structure:

...a replacement of syntactic trees?

The hypothesis is that SL can be described with a set of such parametrised azalistings. The resulting grammar is no more limited to synchronisation with lexical boundaries.

Prospects in automatic generation

- Sign synthesis: flexible framework for time sync of all body activities, usable as input to virtual signers
- Language processing and building grammars: multi-linear grammar, not driven by lexical segments

(*) Corpus for the study: DictaSign LSF corpus, see www.dictasign.eu (EU-FP7)

References