

Computational Linguistic Models of American Sign Language Classifier Predicates

A majority of deaf high school graduates have only a fourth grade English reading level, and so machine translation (MT) software which could translate English text into American Sign Language (ASL) animations could significantly improve deaf individuals' access to information, communication, and services.

Previous English-to-ASL MT projects have made limited progress by restricting their output to subsets of ASL phenomena - thus avoiding important linguistic and animation issues. None produce classifier predicates (CPs), a phenomenon in which signers use special hand movements to indicate the location and movement of invisible objects (representing entities under discussion) in space around their bodies. CPs are ubiquitous in ASL and necessary for conveying many concepts.

This project is developing linguistic models to account for the generation of these phenomena, and these representations will underlie an English-to-ASL MT software system capable of producing CPs.

The computational and linguistic goals of this project have been complimentary. The 3D spatial properties of CPs have necessitated the use of graphics and animation software to represent the 3D arrangement of the real-world scene being described by a CP. Traditional MT software is not designed to interact with such 3D graphic models, and so novel machine translation technologies have been developed to accommodate them.

Reciprocally, the computational perspective of this project has motivated a more formal linguistic account of the generation of ASL CPs than ever before developed. Further, the engineering requirements on technologies used in the MT software system have inspired the design of new linguistic representations for classifier predicates.

Key Terms:

American Sign Language, Classifier Predicates, Machine Translation, Computational Linguistics, Natural Language Generation

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