USING THE METHOD OF RULE-BASED MACHINE TRANSLATION FOR TRANSLATION FROM UKRAINIAN SIGN LANGUAGE

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Due to the growing number of applied research a development of the newest technologies for situation improvement of the people with physical disabilities is taking place. Therefore, development of methods and means of Sign Language (SL) translation into the text is a promising area of research. For easy communication with deaf people it is enough to develop a system of sign language translation into the text and vice versa. It is necessary to provide comfortable access to modern information resources presented in the information systems and networks for people who communicate using sign language. In order to achieve this objective a difficult problem of translation videos with a Sign Language into the text entry is to be solved. One of the striking differences between signed and spoken languages is the lack of a formally adopted writing system for SLs. Translation of Ukrainian Sign Language (USL) is a complex task, that requires the analysis grammar of USL, building rules for translation of Ukrainian Sign Language into text and vice versa. Sign Language is characterized by its interactivity and multimodality, which cause difficulties in data collection and annotation. For our research we built a corpus that contains 220 sentences on Ukrainian Spoken Language and their respective translations on Ukrainian Sign Language. They are stored in a text file. Ukrainian Sign Language is annotated by gloss. Glosses are written words, where one gloss represents one sign. Ukrainian Sign Language nouns and verbs do not have any case endings, so it is mostly the word order that tells you where things are in a sentence, and how they interact. Using of the rule-based machine translation for the Ukrainian Sign Language are considered. The basic principles of transforming from Ukrainian Sign Language into Ukrainian Spoken Language are described. The rules for translating into Ukrainian Spoken Language including grammatical features of Ukrainian Sign and Spoken Languages are selected. For evaluating the performance of the system, the following evaluation measures have been considered: WER (Word Error Rate) and PER (Position Independent Error Rate). In our experiments, a rule-based translation module reaching a 58,42% WER and 36,67% PER.

Keywords – Ukrainian Sign Language, bilingual corpora, rule-based machine translation, grammar.