

# ENTITY-RELATIONSHIP MODEL OF UKRAINIAN SIGN LANGUAGE CONCEPTS

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The modern science development, society computerization, use of multimedia and Internet technologies have created conditions for creation of computer communication systems for people with impaired hearing. Automatic translation means help these people to communicate and to overcome language and cultural barriers. The urgent task is to develop software tools that help in the study and translation of Ukrainian Sign Language (USL). For easy communication with deaf it is enough to create a system of sign language translation into text and vice versa. The complexity of automatic translation system development of Ukrainian Sign Language is strengthened by the lack of large dictionaries and corpus of USL. The absence of such corpora for the Ukrainian Sign Language requires the use of an alternative approach - the introduction of semantic concepts (concepts of the subject area) and study of the relationship between semantic concepts. Based on the analysis of linguistic relations between concepts of the Ukrainian Spoken Language and Ukrainian Sign Language entity-relationship model of concepts for building a translation system of the Ukrainian Sign Language is developed. Adequacy of the entity-relationship model of parallel sentences "Ukrainian Spoken Language - Ukrainian Sign Language" is investigated. In order to evaluate the effectiveness of the system operation the following assessment are considered: Word Error Rate (WER) and Position Independent Error Rate (PER). The evaluation quality of the translation system using the entity-relationship model concepts shows a reduction in the percentage of incorrectly translated words in those sentences that contained concepts, from 42,83% to 34,58% WER and from 18,35% to 14,65% PER. The disadvantage of the system is the small amount of data for testing (220 sentences and 50 concepts). In the result of the research in order to translate Ukrainian Sign Language is generated grammatically correct constructions of spoken language, that reproduce the content of sign expression.

Keywords – Ukrainian Sign Language, bilingual corpora, concept, entity-relationship model, grammar.