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CHAPTER 3

Information technology for automated translation from inflected languages to sign language

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INTRODUCTION

This chapter describes the information technologies, that allow inflected languages to the sign languages (for hearing impaired/deaf people) for, using machine translation (Barmak et al. 2012), (Barmak et al. 2013), (Barmak et al. 2014), (Krak & Romanyshyn 2014), (Krak et al. 2011), (Krak et al. 2012), (Krak et al. 2014). The main aim of the research is to elaborate new computer systems for training and communication for the deaf people.

According to World Health Organization, there are about 70 million deaf people (and people with severe hearing loss) who use sign language as their first language or mother tongue. That are tens of millions of people for whom it is necessary create equivalent means for communication in society. Due to Paragraph 7 of the Rules Appendix 5 to UN Resolution 48/96 "Standard Rules on the Equalization of Opportunities for Persons with Disabilities" these needs have been expressed as follows: "We need to take care of that sign language was used for teaching deaf children, in their families and communities. We should also provide services in sign language to facilitate communication with other deaf people." If we consider that people with hearing disabilities need to communicate with family, friends, neighbors, the circle of people with whom they maintain contact will be hundreds of millions of people. Despite the rehabilitation work on verbal language learning, the communication with the deaf person is characterized by certain difficulties.

The main form of communication of deaf people is sign language. Sign language has national characteristics. People with hearing impairments use two sign languages which have different grammar and a different set of gestures for communication:

1. conversational sign language used in everyday communication and has its own (different from natural spoken) grammar;
2. tracing sign language used in official and business environment (includes gestures and manual alphabet, which is used to play words with the letters given), has no own grammar, uses the rules of national language grammar.

The rapid development of computer technology, its availability in a variety of mobile devices, development of appropriate technologies as software and hardware (distributed databases, cloud computing, Internet technologies, etc.) encourages their involvement in intensive solution of socially significant problems. One of these problems is the inclusion of deaf in active social life. The main obstacle to solving this problem is difficulty in communication between deaf and hearing people. Information technology for nonverbal communication of deaf could help to solve this problem.