Sign Language Translation: an Overview of the SignON Project

The SignON project (https://signon-project.eu/) is a Horizon 2020 project that focuses on the research and development of a sign language translation framework. According to the World Federation of the Deaf, sign languages are the primary means of communication for over 70 million deaf and hard of hearing individuals. Despite this, these languages are rarely included in the ongoing developments of NLP and other language technology advancements. Machine translation research which target sign languages is still in its infancy, mainly due to the lack of data and effective representation of signs (including the lack of a standardized written form for sign languages). SignON aims to rectify the lack of technology and services for the automatic translation between signed and spoken languages, through an inclusive, human-centric solution which facilitates communication between deaf, hard of hearing and hearing individuals. In SignON, we employ an MT approach that (i) focuses on processing and understanding individual languages, (ii) employs a common multi-lingual representation to facilitate translation and (iii) uses symbolic as well as deep learning methods for the synthesis of a virtual signing avatar. This approach involves automatic sign language and speech recognition, natural language processing and understanding, sign and speech synthesis, text generation and, most importantly, representation of utterances in a common frame of reference – an interlingual representation space based on both embeddings and symbolic structures. Using various sign language resources, we have built state-of-the-art models and components for sign language recognition, exploiting CNN-, RNN- and transformer-based models. The research and development carried out within the SignON project aims to become a foundation for the current and future development of automatic translation for sign languages.