Breaking the Language Barrier

Automatic Simultaneous Translation Service for University Lectures

Academic lectures and technical presentations often provide high-quality contents while addressing an audience speaking various mother tongues. As a result of the language barrier between the person speaking and the interested listeners, many lectures and presentations do not reach the complete audience.

Lectures at Karlsruhe Institute of Technology (KIT) are predominantly held in the German language. Hence, foreign students wishing to study at KIT have to learn German until they reach the high level required for understanding scientific and technical presentations of complex content. For this reason, foreign students mostly attend preparatory German courses of one year duration. However, experi-ence shows that knowledge of the German language after one year of learning is not sufficient to follow German lectures and to speak on the level needed.

As human interpreters to overcome the language barrier would be too expensive, we propose our automatic simultaneous lecture translation system to solve the problem. For this purpose, we apply techniques of spoken language translation (SLT). These techniques combine automatic speech recognition (ASR) with machine translation (MT) and other auxiliary components for the system to simultaneously translate spoken German into English on a permanent basis.

Automatic simultaneous lecture translation: A service for foreign students at KIT.

The result of the speech recognition and translation is permanently displayed on a webpage (lecture-translator.kit.edu).

The system works with the help of a cloud-based service infrastructure. The speech of the lecturer is recorded by a local client and transmitted to the infrastructure. A service then administrates data flow through the ASR, MT, and other components. The final result is accessible via a webpage (lecture-translator.kit.edu) that permanently displays the result of speech recognition and translation.

In addition, the system archives the lectures and allows for a later search via text queries. The automatic lecture translator has been installed as a permanent service in various lecture halls of KIT since 2012.

The speech recognition part of the lecture translation can also be used to provide real-time transcripts of speeches and lectures, e.g., in the form of subtitles. This makes content better accessible, e.g., for hearing impaired or for audiences in public spaces, in which they cannot listen to the sound of broadcasts but can read the subtitles on the screen. For the European Parliament, we implemented a proof-of-concept in which we provided real-time subtitles of plenary sessions of the European Parliament in English, French, German, Italian, and Spanish via a website.

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