

Tomasz Ziętkiewicz

Abstract of PhD Thesis

„Design and implementation of a system for automatic error correction and normalization of speech recognition results”

The dissertation presents proposed methods for automatic error correction and normalization of speech recognition results. The development of these methods took into account the context of their deployment within dialogue systems. The paper presents this context and the specifics of the development of ASR correction models in an industrial environment.

The "Tag and correct" error correction method proposed in the paper treats the problem of error correction as a problem of tagging sequences with edit operations. The paper offers a detailed description of the method including the set of edit operations used, the process of generating tags of edit operations, and a method of applying them to a sentence being corrected. The results of numerous experiments carried out on diverse datasets are presented. The "Tag and restore" method of restoring punctuation marks, inspired by the "Tag and correct" method, is also presented.

The described approach to the problems of correction and normalization of output from a speech recognition system is characterized by the possibility to precisely control the operation of the method. The ability to use any tagging model within this method makes it adaptable to the environment in which the method is to be deployed, by selecting models with computational requirements that match the environment resources. These features account for the usefulness of the proposed methods in production environments.

The application of the proposed error correction method to study the impact of ASR errors on the efficiency of NLU models is also presented.

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