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Statistical Alignment Models



# A Systematic Comparison of Various Statistical Alignment Models

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## Abstract Authors


We present and compare various methods for computing word alignments using statistical or heuristic models. We consider the five alignment models presented in Brown, Della Pietra, Della Pietra, and Mercer (1993), the hidden Markov alignment model, smoothing techniques, and refinements. These statistical models are

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compared with two heuristic models based on the Dice coefficient. We present different methods for combining word alignments to perform a symmetrization of directed statistical alignment models. As evaluation criterion, we use the quality of the resulting Viterbi alignment compared to a manually produced reference alignment. We evaluate the models on the German-English Verbmobil task and the French-English Hansards task. We perform a detailed analysis of various design decisions of our statistical alignment system and evaluate these on training corpora of various sizes. An important result is that refined alignment models with a first-order dependence and a fertility model yield significantly better results than simple heuristic models. In the Appendix, we present an efficient training algorithm for the alignment models presented.

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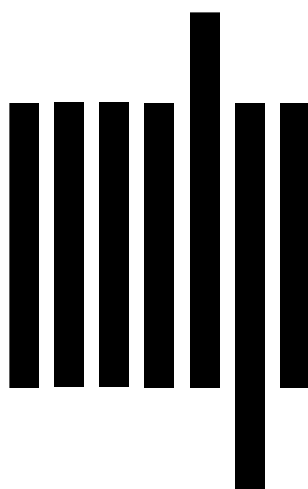
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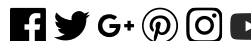
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