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ESTABLISHING DOCUMENT STRUCTURES AS GAME-PLAYING

24.02.2011, 10:00-10:30

In natural language generation, document structuring is typically realized by establishing rhetorical relations between conceptual representations (messages) of corresponding text spans. The result is a tree structure for the entire document plan with rhetorical relations as nodes and messages as leaves of the tree. Since communicative criteria play a fundamental role in establishing rhetorical relations between messages, we propose a game-theoretic approach to document structuring.

We use a multi-iteration game algorithm to establish rhetorical relations. For this, we assume two players: The generation system S and a listener model L that simulates the behavior of the user. Speaker strategies are the rhetorical relations that have to be established between messages to create a more complex message. The listener actions are based on abductive reasoning, since L 's task is to find an explanation why the single or complex messages might hold true. Nash equilibria determine the optimal rhetorical relation - abductive reasoning combination.

In order to test the adequacy of our model, we apply it to the generation of descriptions of periodic measurements by a runner's heart rate monitor for different users. Our simulations help us to grasp how the payoffs (and additional parameters) must be fixed in order to get suitable document structures. Motivating the payoffs is still one of the most problematic aspects of game-theoretic models of communication, but testing the parameters by computational modeling gains insights into the adequate formulation of the utility functions.