

Automated Framing Analysis: A Rule Based System for News Media Text

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Abstract. *The number of available digital texts grows exponentially creating a need for automated framing analysis. Using computational linguistics to identify framing functions in news articles represents a cost effective method for examining large amounts of data. The proof of concept described in this paper is a rule based system that automatically identifies framing functions present in news. The proposed system identifies the morphological, syntactical, and relational information of each word of the news article text using a parser. A set of rules is applied to the semantic role of each word enabling an automated detection of framing functions using sentiment analysis.*

Keywords: Frame analysis; Automated; Semantic network; Parser; Sentiment analysis.

Introduction

The use of computational linguistics in the social sciences represents new research opportunities in today's digital age. Vast amounts of texts available in both online databases and user created content are rich sources of data that can be examined. Framing analysis is a popular methodology used in social science to analyze the content of textual data and is usually performed manually. The costs involved when examining large amounts of data in addition to the training of coders represent some of the limitations of such an approach. Current methods for automated frame analysis include the use of word clustering for the identification of framing in text. Word clustering approaches have their limitations as words that embody the meaning of the news articles might not be present. Taking into account the limitations of word clustering, the aim of this article is to describe a rule based system that automatically identifies framing in news articles. In order to automatically identify framing the system first transforms the input text into semantic roles and then applies an automated sentiment analysis. The system for automated framing function identification presented in this article is composed of the following four modules:

1. Parsing module; determines the morphological and syntactical category of each word of the input text.
2. Semantic network module; determines the semantic roles of each word of the input text.
3. Sentiment analysis module; assigns a positive or negative valence to the words of the input text representing semantic roles.
4. Framing function module; combines the information provided by the previous modules and automatically determines which sentences of the input text contain Robert Entman's framing functions.

The attempt to automatically identify framing functions in news article text is a work in progress inspired by the works of Bjorn Burscher and Wouter van Atteveldt. The method proposed is a novel approach that combines automatic sentiment analysis implicature rules developed by Lingjia Deng and Janyce Wiebe with Charles Fillmore's semantic roles. The system first transforms the input text into semantic roles and then applies sentiment analysis in order to automatically identify Robert Entman's framing functions in text.

Theoretical framework

The approach to framing analysis utilized by the system described in this article is based on Entman's definition of framing which states: "Frames, then, define problems – determine what a causal agent is doing with what costs and benefits, usually measured in terms of common cultural values, diagnose causes – identify the forces creating the problem; make moral judgments – evaluate causal agents