

## REPRESENTING AND RECOGNIZING POINT OF VIEW

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### Abstract

A representation of *ideological point of view* is articulated and a method for detecting the point(s) of view expressed in a news story is described. A version of the method, *actor-role analysis*, is encoded in a computer program, *SpinDoctor*, which can automatically detect the point(s) of view represented in some news stories.

*SpinDoctor* is a computer program designed to detect *ideological point of view*<sup>1</sup> in news stories. To detect point of view, *SpinDoctor* implements a critical reading strategy called *actor-role analysis* (Sack, 1994a; Sack, 1994b). Actor-role analysis was developed around the following observation: one means of detecting point of view is to examine how certain people, who appear again and again in the news (i.e., news *actors*), are described or portrayed (i.e., are assigned *roles*). Thus, for example, if one is given a news story which mentions Oliver North -- (in)famous for his role in the Iran-Contra affair and recent senatorial campaign -- and the story assigns North the role of *patriot* (via the use of certain adjectives and verbs), one can be quite certain that the point of view expressed in the story is significantly to the right (in the spectrum of US politics) than that expressed by another news story which assigns North the role of *villain* or *criminal*.

Two aspects of actor-role analysis, as it is implemented in the *SpinDoctor* system, might be of especial interest to researchers concerned with textual analysis:

(1) *A representation for ideological point of view:* Although practically all, contemporary, AI systems for NLP are capable of finding actors and roles in texts to fill in scripts, frames, or templates (e.g., Jacobs and Rau, 1993), none of these systems assign any political significance to the pairing of certain actors with certain roles (e.g., North as patriot versus North as criminal). By contrast, I maintain that sets of actor-role pairs are an interesting and implementable representation for differing ideological points of view. The proposed actor-role representation of ideological point of view accords with some recent work by Lakoff (1991) and generalizes and improves upon previous AI work on representation of ideology (e.g., Abelson and Carroll, 1966; Carbonell, 1978).

(2) *An algorithm for anaphoric resolution:* Actor-role analysis incorporates a new anaphoric resolution algorithm. It is shown how careful attention to actor-role pairings assists in the resolution of anaphoric reference. By noting, for example, that an instance of the pronoun "he" is cast in the role of *victim* and that, earlier in the same story, "Lieut. Rodriguez" is also cast in the role of

*victim*, *SpinDoctor* postulates the resolution of the instance of the pronoun "he" to the proper name "Lieut. Rodriguez."

*SpinDoctor* uses three main data structures: (1) *Actors* are collections of noun phrases and pronouns hierarchically arranged into groups (e.g., "President Cristiani" is declared to be a member of actor group "government officials" which, in turn, is declared to be a part of a larger group called simply the "government" that also contains "Army officers" and others. (2) *Roles* are packets of verbs, adjectives, and adverbs and some associated syntactic constraints. Thus, for example, the role *criminal* is associated with the subject of the verb "kidnap" while the role *victim* is associated with the object of the verb. (3) *Points of View* are sets of actor-role pairings. Thus, for example, to find a news story from the late-80s/early-90s from El Salvador written from the government's point of view, the machine looks for stories in which the government plays the role of the *source* of the story, the government describes its violent actions as legitimate military actions (i.e., assigns itself a *military* role), while, it assigns the guerrillas the role of *terrorist* by labeling the guerrillas' violent actions as *criminal* actions. The user of the system fills the database with actor, role, and point of view definitions. However, currently, the hand-built role definitions are being replaced with definitions from Roget's Thesaurus and Wordnet, an on-line thesaurus created by George Miller's group at Princeton University.

The analysis process followed by *SpinDoctor* is as follows: (1) Given a news story *SpinDoctor* finds which noun phrases (i.e., actors) play which roles in the story. (2) Then, it determines which actors are of a similar group or are identical to other actors. To do this it does both (a) anaphoric resolution (e.g., determining who or what is being referenced when pronouns like "he," "she," and "it" are used); and, (b) actor grouping (e.g., inferring that "an army spokesman," "Lieut. Rodriguez," and "Gen. Bustillo" are all a part of the same group (e.g., the "armed forces"). (3) It constructs a profile of the analyzed story which describes how often (within the given story) top-level actors were assigned different roles. (4) Using weighted actor-role bindings allows it to distinguish, for example, stories in which the government is cited as a source once and the guerrillas are cited ten times from stories in which the guerrillas are cited as a source less often than the government. Finally, it matches the weighted actor-role bindings against the point of view definitions, determines which point(s) of view match(es) best and outputs the name of the one (or more) best-matching point(s) of view.

### References

- Sack, W. (1994a) On the Computation of Point of View, in *Proceedings of the National Conference of Artificial Intelligence* (AAAI 94), July 31-August 4, 1994, Seattle, WA.
- Sack, W. (1994b) *Actor-Role Analysis: Ideology, Point of View and the News* (Tech. Report 94-005 and MS Thesis) Cambridge, MA: MIT Media Laboratory.

<sup>1</sup> *Ideological* point of view characterizes the political slant of an entire story; it is different from *psychological* point of view (e.g., as it is used by Wiebe, 1994) which characterizes the source of a given sentence or statement contained within a story.