

Metaphor: A Computational Perspective

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Metaphors are intriguing. We know that George Lakoff and Mark Johnson, in their book *Metaphors We Live By*, pointed out that our daily language is full of metaphors (Lakoff and Johnson 1980). Metaphors are not rare at all as linguistic events and in general as a means of human communication (e.g., in visual art). Thus, more than an exception, they seem to be a necessity for our mind. People use metaphors as strategies to link concepts, to deal with situations, and sometimes to suggest solutions to problems. For example, you can see *criminality* as a *monster* or as an *illness*. What you have in mind to deal with it is probably to fight in the former case, and to cure or to plan prevention in the latter. Nonetheless, metaphors are extremely difficult to model in a computational framework. What is literal? What is metaphorical? Making this distinction has often proved to be a daunting task, even for a human judgment. Metaphors—so bound to our way of thinking and entangled with a huge quantity of knowledge and linguistics subtleties—constitute an excellent research problem for computational linguistics and artificial intelligence in general. We could probably say that they belong to the AI-complete problems. The difficulty of these computational problems is equivalent to that of solving the central artificial intelligence problem—making computers as intelligent as people.

Tony Veale, Ekaterina Shutova, and Beata B. Klebanov are experienced researchers in the field of figurative language processing. Their book is an excellent resource and a good reference for anyone who plans to tackle the subtleties of this complex topic. The book offers a comprehensive approach to the computational treatment of metaphors and of related figurative devices such as simile, analogy, and conceptual blending. The reader is introduced to multiple computational perspectives, from symbolic and statistical approaches to interpretation and paraphrase generation, without omitting contributions from philosophy on what constitutes the significance of a metaphor.

The first three chapters introduce the reader to the concept of metaphor, particularly the theoretical foundations profitable for approaching the problem computationally. Particularly useful is the explanation of the related figurative devices: similes (the comparison of one thing with another of a different kind, used to make a description more emphatic or vivid, e.g., *John is as brave as a lion*); analogy (a comparison between one thing and another, typically for the purpose of explanation, e.g., *marriage is slavery*); and conceptual blending (a cognitive theory, originally developed by Gilles Fauconnier and Mark Turner [Fauconnier and Turner 2002], which refers to a set of cognitive operations for combining—or blending—words, images, and ideas in a network of “mental spaces” to create meaning, e.g., *the painting in George Clooney’s attic* is a cue to create a conceptual

blend from the input spaces ‘George Clooney’ and ‘Dorian Gray’). The chapters are detailed and rich in historical and technical references to also give the flavor that among linguists and philosophers those topics are subject to ongoing debate. Indeed, the authors also warn that it can be quite a challenge, even for a seasoned researcher, to determine precisely what figurative mechanism is at work in any given example of non-literal language.

The fourth chapter becomes more technical; approaches the crucial problem of metaphor annotation. Without good quality corpora, any computational exploration is a vain attempt. Researchers in the corpus linguistics tradition have sought a reliable method or protocol for identifying metaphors in any given text. This line of work culminated in a protocol called the Metaphor Identification Procedure (MIP), developed by a group of metaphor researchers publishing under the acronym of *Pragglejaz* (using the first letters of the first names of the researchers) (Pragglejaz-Group 2007). The chapter also provides details about some of the existing metaphor-annotated data sets, including information about language, data source, annotated categories, annotated lexical items, context provided during annotation, reliability, size, and licensing information.

Chapters 5 and 6 give an account of computational techniques to deal with metaphor. As is usual in computational linguistics, the problem can be approached by exploiting knowledge sources (e.g., using WordNet and lexical ontologies, or with crafted knowledge extraction from free text, possibly from the Web), or making ample use of statistical methods based on distributional association measures, vector space models, supervised learning, clustering, and latent Dirichlet allocation topic modeling.

I found the last chapter, about applications of metaphor processing, quite thought-provoking. The authors indeed give a flavor of a rich list of applicative scenarios, ranging from creative writing tools to creative information retrieval. With the advent of effective tools to automate the detection and interpretation of metaphors, computers would help human users to be more comprehensive and efficient in obtaining data to satisfy their information needs, with the aim of augmenting their creative reach and expressiveness. Moreover, dealing with tasks from the typical territories of creative professionals, such as advertising or narrative texts, raises and addresses challenging research questions.

Let me conclude with a final note: The book is very well-written. It is a real pleasure to read, unusual for scientific writing. Through this, it is evident that the authors are fond of language and writing, and think of metaphors as the very soul of our communicative skills.

References

- Fauconnier, Gilles and Mark Turner. 2002. *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*. Basic Books, New York.
- Lakoff, George and Mark Johnson. 1980. *Metaphors We Live By*. University of Chicago Press, Chicago.
- Pragglejaz-Group. 2007. MIP: A method for identifying metaphorically used words in discourse. *Metaphor and Symbol*, 22:1–39.

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