Chapter 8
Metaphorical Communication about Nature

ABSTRACT

Metaphors are present in our thoughts and make invisible concepts perceivable. The metaphorical way of perceptual imaging is discussed in this chapter, particularly the use of art and graphic metaphors for concept visualization. We may describe with metaphors the structure and the relations among several kinds of data. Metaphors may represent mathematical equations or geometrical curves and thus make abstract ideas visible. Most metaphors originate from biology-inspired thinking. Nature-derived metaphors support data visualization, information and knowledge visualization, data mining, Semantic Web, swarm computing, cloud computing, and serve as the enrichment of interdisciplinary models. This chapter examines examples of combining metaphorical visualization with artistic principles, and then describes the metaphorical way of learning and teaching with art and graphic metaphors aimed at improving one's power of conveying meaning, integrating art and science, and visualizing knowledge.

INTRODUCTION

Linking science and visual presentations may become easier with the use of metaphors that are suitable for creating science-inspired artistic projects, so these themes will return in chapters that follow. Metaphors present in our visual and verbal environment include iconic and symbolic images, representations inspired by the rules and phenomena observed in nature, as well as simulations and visualizations of concepts and events presented in metaphorical way. Metaphorical imaging of abstract

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concepts includes metaphors based on natural objects, metaphors related to the physical senses, and conceptual metaphors that apply the known rules or phenomena as a way of translation of abstract concepts. Nature derived metaphors support data visualization, information and knowledge visualization, data mining, semantic web, and serve as the enrichment of interdisciplinary models. The further text examines examples of combining metaphorical visualization with artistic principles, and then describes metaphorical way of learning and teaching with art and graphic metaphors aimed at improving one's power of conveying meaning, integrating art and science, and visualizing knowledge.

TRANSLATION OF MEANING WITH VISUAL AND VERBAL METAPHORS

Few would challenge the assumption that people think for the most part in pictures. Communication proceeds with the use of language that is highly metaphorical, and many hold that there is no non-metaphorical thought. In many instances, art is metaphorical. A recurrent theme throughout this book is visual communication and visualization of ideas that is pictorial and linguistic at the same time, in both cases being metaphorical. Visualization has been generally seen as the presentation of pictures showing easy to recognize objects that are connected through some well-defined relations. The effectiveness of making the concepts or data comprehensible and visually appealing often depends on choosing a metaphor that is suitable to carry complex concepts and visual storytelling.

There is common agreement in opinion that a metaphor is a figure of speech in which a word or phrase that ordinarily designates one thing is used to specify another, thus making an implied mental comparison. Metaphor is a best known, persuasive rhetoric figure used to increase the effectiveness of a message, with an elaborate taxonomy of metaphorical tropes such as metonymy, simile, analogy, synecdoche, thought maps, and concept maps. Metaphor reflects cognitive operations; it makes us see one thing in terms of another and create a new meaning. Metaphors are not true or false. Thus, metaphors may involve mental models which otherwise wouldn't be easily grasped. A metaphor may indirectly suggest the meaning of something that is not easily understood, and transfer it from one thing to another without direct comparison, with the use of 'like' or 'as'. For example, we say 'the tip of the iceberg' to imply a small, visible part of a big problem; a symbol of 'heart' is a metaphor. We use interface metaphors everyday when we talk about online communication using familiar objects for organizing the corresponding elements related to the computer, a folder, files, and many other metaphors.

Metaphors often address our basic experience, for example, when our minds are conditioned by habit to visualize quantity: 'more' as something going up and 'less' as an object or a graph going down (Lakoff & Núñez, 2001). With inspiration coming from nature and/or mathematics, realities created with the use of metaphors refer to our imagination and experience based on physiological reality of the mind. One may say, the prevalent metaphorical imaging of abstract concepts includes natural metaphors of living organisms, often incorporating behavior such as motion and gesture, metaphors based on natural objects found in nature, visual, auditory, or other metaphors related to the physical senses (often in the use of symbols or icons), and conceptual metaphors that apply the known rules, phenomena, and mathematical ideas as a way of translation of abstract concepts (Lakoff & Núñez, 2001).

Metaphorical artwork does not necessarily present its content as representational depiction showing the physical appearance of objects or people. "The Swirl" (Figure 1) shows immaterial concepts translated into an abstract image. Viewers may want to create their own experience of the dynamic physical processes, find a counterpart in music, or think about the events occurring in cosmos. Somewhere in a space between the

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