

# Chapter 16

## Playful Interfaces for Scientific Image Data: A Case for Storytelling

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### ABSTRACT

*Recent developments in the field of HCI draw our attention to the potential of playful interfaces, play, and games. This chapter identifies a new but relevant application domain for playful interfaces (i.e. scientific practice involving image data). Given the thesis that play and playfulness are relevant for a researcher's interaction with scientific images, the question remains: How do we design playful interfaces that support meaningful ways to playfully engage with scientific images? This chapter introduces, investigates, and implements storytelling with scientific images as a worthwhile instance of playful interaction with scientific images. To better understand and further exemplify the potential of storytelling with scientific images, the chapter contributes both a review of utilitarian usages of storytelling with images and findings from a case study storytelling game.*

### INTRODUCTION

This chapter considers recent Human Computer Interaction (HCI) developments regarding play and playfulness and their applicability for the design of interfaces for scientific data. Scientific practice is a particularly important human activity, both economically and socially, and a data-intensive practice that can be extensively and diversely supported by computerized systems. We believe that interfaces to scientific data can facilitate

interactions that go beyond the stereotypical use of computers as data processing machines. Well-designed interfaces, effective displays and interactive tools can potentially empower the human researcher by easing her tasks and amplifying her cognitive capacities. And yet, scientific practice is somewhat neglected by the field of HCI, with interfaces to scientific data often lacking behind current developments in the field. The toolkit of the state-of-the-art HCI has been extended with powerful constructs such as innovative hardware,

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new visualization techniques and interdisciplinary concepts such as serious games. Motivated by the enormous interest of HCI in play and games, this study considers play and playfulness as a means to interact and engage with scientific data.

The need for playful interfaces in the sciences becomes even more prominent when considering the creative nature of scientific inquiry. Scientists are professionals who engage daily in creative problem posing and solving. There is nothing mystical or romantic here, no muse visitations or bursts of inspiration: Scientific practice is creative for it “involves slow, methodical work, with mini-insights occurring every day” (Sawyer, 2006, p. 269). Such mini-insights vary from new ideas to new observations to new realizations and new inferences and can be based on or derived by scientific data. We believe that such creative responses to data can be facilitated by a more open-minded and playful attitude of the researcher. Creative responses to data can inform everyday scientific practice but, for such responses to occur, a moment of openness, playfulness and exploration may be required.

If play and playfulness are relevant for scientific practice and if play and playfulness are relevant for the design of interfaces, how do we design playful interfaces that support relevant ways to playfully engage with scientific data? This chapter introduces, investigates and implements storytelling with scientific images as a worthwhile instance of playful interaction. We conduct a broad review of practices and products involving storytelling with images and further implement a case study game that promotes storytelling with scientific images. Our major contribution is the investigation of storytelling as a means to playfully engage with scientific images. Nonetheless, our take on playful interfaces revisits current practices in playful and game-ful design by encouraging an understanding of playful interfaces as interfaces that are playful not because of added playful elements but because of playfulness embedded in the interaction.

## **BACKGROUND**

### **Definitions**

This subsection will briefly define the core topics of this chapter. Note that we aim at providing a general understanding and a common ground in terminology; formal or finite definitions of the concepts involved are out of the scope of this subsection.

### **Play and Playfulness**

Delineating the concept of play is a difficult task and any attempt to do so will unavoidably start from the seminal writings of Huizinga (1955) and Caillois (2001). For a compilation of major formal definitions of play and of game the reader is referred to Salen and Zimmerman (2004). Confronted with the ambiguity of play, Salen and Zimmerman (2004) propose three families of activities, each a superset of the previous:

- Game play, i.e. activities that involve games
- Ludic activities, i.e. activities commonly understood as play
- Playful activities, i.e. ordinary activities exercised in a playful manner

Eventually, the authors propose a definition of play as ‘free movement within a more rigid structure’. This definition, complemented with the aforementioned families of play-related activities, should be sufficient for our discussion.

We define playfulness as the inclination to be less serious, i.e. either more humorous or more experimental or looking for fun and amusement. Playfulness can be understood as the inclination to play; this definition, however, requires us to demarcate what play is. On the contrary, playfulness as the inclination to be less serious allows us to reconsider what engaging in play may amount to. To quote Fullerton et al. (2008, p. 92), “a playful

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