An information visualization system initially shows an overview of the dataset; however, the user can get more detailed information on demand through interactive techniques. Showing such detailed information on demand is critical because we may lose important information in the summarization process [32]. For instance, if an opinion visualization for customer reviews presents the keyphrase "terrible display," only after reading texts from original reviews may the user realize that the keyphrase is concerned with the low-resolution display of a smartphone. In such situations, interactive techniques can help the user to read the original text on demand to understand the context of the summary. Another reason for introducing interactivity is that when we deal with large datasets, given the display limitations, a static visualization cannot show all the data at once. In such situations, interactive techniques can deal with large datasets by changing the view from an overview to more detailed data through direct manipulation, filtering, and zooming [33].

3.1 CHALLENGES FOR OPINION VISUALIZATION

A fundamental challenge of designing any information visualization system arises from the human and display limitations. Our perceptual and cognitive abilities are limited, which must be taken into account to design an effective visualization. Moreover, the limited display size often means there are trade-offs regarding what data should be shown and how they should be shown to the user.

Even if we assume that the visualization addresses these limitations successfully, it could be still ineffective if it does not match the specific task that users care about. In other words, a visualization can be comprehensible by humans but not well suited for the intended task. Therefore it is important to understand the user tasks and carefully choose the best possible visualization design by consideration of multiple alternatives.

There are also some design challenges that are very specific to opinion visualization for social media text data. One particular challenge arises from the noisy nature of social media text, as pointed out earlier in this chapter. As a consequence of noisy text, the results of text mining and summarization methods can be inaccurate. If the visualization does not account for such inaccuracy or uncertainty, the user may reach wrong conclusions after analyzing the data, or may lose trust in the system after realizing that the results are unreliable [34].

In this era of big data, another challenge emerges from the fact that social media data are often generated at a volume and velocity that cannot be handled by most of the existing tools. When we need to deal with such a large amount of data, many basic visualization techniques such as bar charts or scatter plots may not be sufficient to display the information. In such cases, a more complicated visualization may be needed to link multiple types of visualizations through interactions.

In the reminder of the section, we discuss a set of opinion visualization techniques for different text genres and how they address specific design challenges that we have pointed out.

3.2 TEXT GENRES AND TASKS FOR OPINION VISUALIZATION

Most of the previous work on opinion visualization in social media can be broadly categorized on the basis of the text genres and subsequently by the task characteristics, as shown in Table 11.1. We now provide an overview of the key text genres and possible tasks for each of these genres.