

# Chapter 1

## Aspects of Content Generation Through Narrative Communication and Simulation

**Takashi Ogata**

*Iwate Prefectural University, Japan*

**Shin Asakawa**

*Tokyo Woman's Christian University, Japan*

### **ABSTRACT**

*In this chapter, the authors focus on narrative contents by considering and analyzing narrative communication and simulation. In particular, the authors present the multiple narrative structures model and informational narratology as original theoretical frameworks in seeking to undertake narrative hierarchical and multiple structures and micro and macro structures. The authors also introduce, as designing and developing systems, the integrated narrative generation system (INGS) for implementing the narrative micro mechanism, and the geinō information system (GIS) for designing the macro mechanism. Furthermore, neural network technologies including deep learning are also introduced to show the technological possibility of implementing narrative generation systems. These show a synthesized approach or establish a paradigm for narrative generation studies.*

### **INTRODUCTION**

In this chapter, the author understands narrative contents from the viewpoint of communication and simulation. In particular, the central issue is to consider narrative simulation systems based on the characteristics of narrative communication, namely the problem of narrative generation systems. Previously, there has been little research dealing with narrative contents from the viewpoints of narrative communication and simulation, and aimed at systematic realization and modeling as narrative generation systems. Based on the above key terms or concepts, this chapter presents both concrete models of narrative generation and narrative generation systems as narrative simulation. This chapter also describes

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an approach to combining narrative communication and simulation with new technologies, particularly neural networks and deep learning.

The author begins by presenting the key terms or concepts in this chapter and throughout the whole of this book. “Content” means the semantic aspect of information, in contrast to the formal aspect of information, which also exists. For example, the composition of a novel, such as chapter 1 and chapter 2, corresponds to a formal aspect and event sequence that can be summarized as a story, while the plot is a semantic aspect of that content. Further, by the term “narrative content,” the author means a type of content that represents narrative or includes the element of narrative in various forms. “Narrative communication” means various types of communication structure that appear in various aspects of a narrative, while “narrative simulation” is equal to simulated narrative creation or collection by a human and narrative generation system, and artificial intelligence systems to perform and collect the narrative simulation. “Narrative content” refers to informational content to be sent to such receivers as readers and audiences; the concept is associated with reception and consumption through the communication process between the sender and receiver.

Originally, “narrative” in the title of this book was used in the broad sense, from novels, poems, and films to games, advertisements, and psychological narratives. The chapter appendix shows a comprehensive list of narrative genres as compiled by Ogata (1999a), based in particular on Japanese narrative phenomena.

The authors have divided the background research areas into the following two fields: application fields and the fields of methods, theories, and technologies. The authors’ main application fields include narrative or story generation, natural language generation, dialogue generation, media (image, music, and so on) generation, interactive generation, and other related content generation fields. The next main methods, theories, and technologies include various fields in artificial intelligence and cognitive science, in particular knowledge representation, natural language processing and generation, conceptual dictionaries and ontology, media technologies, knowledge acquisition and text mining, neural network and deep learning, and other related fields. In this study, although the applicable technological objective is to develop narrative generation systems, the development approach is supported by theoretical studies.

The first two parts in the “BACKGROUND” section, i.e., content generation and narrative generation, comprise the applicable and technological systems. After the “BACKGROUND”, Ogata discusses problems of “narrative communication” and “narrative simulation.” Regarding the former, in its association with multiple narrative structures as one of Ogata’s (2016a) theoretical foundations, the author presents an entire framework of narrative generation in which micro and macro narratives exist and are related to each other. As an architecture that simulates both of the above mechanisms under an organic mechanism, the author continuously introduces an integrated narrative generation system called the INGS (Ogata, 2016a) and a *geinō* information system called the GIS (Ogata, 2016b). Although there are various narrative levels, including personal and social or collective levels, automatic, semi-automatic, and interactive levels, and so on, the authors have been tackling automated narrative content generation based on narrative simulation technologies, mainly using artificial intelligence. On the other hand, Asakawa, who is an author of this chapter, provides a simple explanation of content generation studies using neural networks and deep learning (Asakawa, 2015a, 2015b, 2016). In the future, it will be possible to integrate the approaches of Ogata and Asakawa in their narrative generation systems.

This research plan will be conducted using interdisciplinary methods, including informatics (artificial intelligence, cognitive science, natural language processing, media technologies, neuroscience, deep learning), literary studies (narratology, literary theories), and social science areas (management science,

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