Automatic Generation, Creativity, and Production of Narrative Contents

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Abstract

According to the concept of this organized session, in this presentation, we will consider the study of automatic narrative or story generation as a research field of artificial intelligence in the following levels: generation, creation, and production. Firstly, we study the technologies of narrative or story generation systems based on mainly artificial intelligence and cognitive science. Next, the artistic and aesthetic problems of narrative creation are considered in the relationships with the technologies and systems of narrative generation. Further, issues toward organizational or social narrative production are presented. The survey and discussion will conduct based on topics in this session relating to a game and advertising systems and our integrated narrative generation system.

Keywords: Multiple narrative structures model, Integrated narrative generation system (INGS), Geino information system (GIS), Narrative generation, Narrative production, Narrative creation.

1. Introduction

This organized session, *Automatic Generation, Creativity, and Production of Narrative Contents*, considers the study of automatic narrative or story generation as a highly interdisciplinary research field of information technologies, such as artificial intelligence (AI) and cognitive science, and literary theories, such as narratology.

For the author, this issue can be focused on the following levels: generation, production, and creation. The first automatic narrative "generation" means the technological aspect of systems that automatically generate narrative texts. In particular, it indicates narrative generation mechanism as a single subject. By contrast, we call narrative generation phenomenon as a collective and organizational level narrative "production". This differentiation is dependent upon a narrative model by multiple narrative structures that the author has proposed as in the following section. The word of production is closely associated with the organizational or social narrative making. On the other hand, the narrative "creation" is a word in a different level that has an artistic and aesthetic nuance.

This paper, at first, present the author's multiple narrative structures model as a background of this consideration. Next, we respectively explain "Integrated Narrative Generation System: INGS"[1] and "Geino Information System: GIS"[2] as frameworks for single level narrative generation and multiple level narrative production. Lastly, according the above frameworks, we discuss the possibilities of narrative-based systems and contents technologies based on the relationships among narrative generation and production, future narrative creation as the level of the artistic and aesthetic problems of narrative.

2. A Model of Multiple Narrative Structures

For the author, one of the basic concepts for narrative generation is "multiplicity". Narrative generation systems are necessary to design as the model of multiple narrative structures. Although this model has various sides from the formal aspect of narrative to the aspect of narrative semantics, an important characteristic is that narrative generation is divided into the next two aspects: narrative generation and reception process based on a single subject and narrative production and consumption process based on many subjects or collective authors. In other words, narrative production (and consumption) process contain many narrative generation (and reception) process. Narrative production and consumption process is the field that is socially opened and is also strongly related to documents and narratives produced by people on WWW.

Further, there exists the narrative multiplicity among various elements, such as story and character, in a narrative. For instance, in character of the *kabuki*, an actor in a work appears with the multiplicity, such as one or several characters in the drama, a person having actual and contemporary body, a person as an existence having the life story with the historical inheritance, etc.

From the viewpoint of the "Expanded Literary Theory: ELT"[3] of the author, this model is partially related to the theory of polyphony by Bakhtin[4] and the theory of inter-textuality by Kristeva[5]. The theory by Bakhtin calls polyphony novels such types of novels that are not integrated by single voice of an author and the theory by Kristeva proposed an idea that all types of documents can respectively be exists in the network with many documents and the fragments including novels and the other genres, whether or not the author is conscious the fact. Both theories amplified narrative multiplicity in respective ways. The multiple narrative structures model comprises these theoretical frameworks.

3. Integrated Narrative Generation System

INGS is a developing narrative generation architecture that corresponds to a single level narrative generation subject. Fig. 1 shows the overview of INGS that various narrative techniques and knowledge are organized in a synthesizing system associating some literary theories for realizing ELT.

INGS is consisted of several components related to narrative generation process and control, narrative techniques for narrative structures' generation, and narrative knowledge including relatively large-scale dictionaries.

At first, the generation process is divided into the three phases: story, discourse, and expression. A "story" generated by the story generation mechanism means the content of a narrative or a temporal sequence of events.

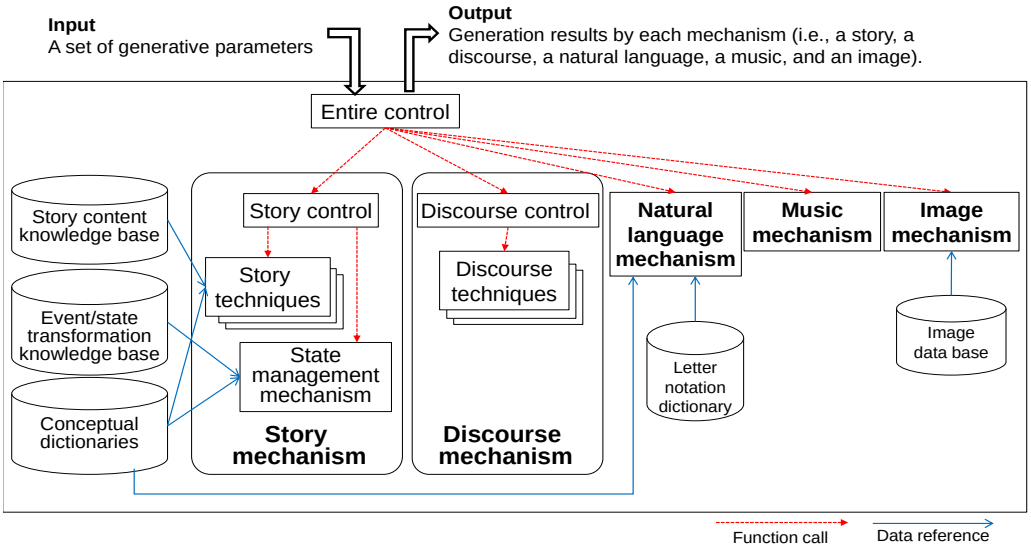

Fig. 1. An overall architecture of INGS[1]

A story is represented by a tree structure consisting of the three basic units: event, relation, and state. A story structure is generated using one or more story techniques and states associating with the events are made according to another mechanism. Through this processing, an event that is a basic element of a story and a discourse are also generated. Each event is basically consisted of a verb concept and some noun and other concepts. A "discourse" transformed by the discourse mechanism means the structural aspect of how to narrate a story. A discourse structure and the surface media to narrate it are distinguished and accordingly it is described with a conceptual representation form. "Expression" means the aspect of narrative representation by various surface media including natural language, visual media, and music.

The control mechanism relating to the process, in many parts, currently utilizes a tentative approach based on parameters and rules for the above three phases. And a circulative process control, which does not limit the generation order among the phase to fixed order, is also adopted in the meta-level mechanism.

The generation of each tree structure of a story and a discourse is performed by using story techniques and discourse techniques that generate or transform from an old tree structure to a new tree structure using knowledge elements including conceptual dictionaries for verb and noun concepts. The surface narrative representation is conducted on the process.

An important design concept is "versatile" which means the potential to be used and applied to any purposes relevant to narrative generation without the limitations of themes and genres. In the future perspective of INGS, we aim at developing a versatile narrative generation architecture through which diverse narratives' generation with various themes, genres, structures, etc is done. It means that INGS can be applied to various narrative production mechanisms as a single level narrative generation subject.

4. Geino Information System

The Japanese word *geino* has a complex meaning that includes elements of shrine rituals, entertainment, and amusement. From the viewpoint of narrative generation research, a *geino* system a whole that multiply contains diverse narrative generation processes and is a multiple narrative phenomenon. For the author's research plan, INGS is contained in GIS.

GIS is a model in which multiple narrative generation and production mechanisms are conducted to do the social level tasks of narrative. INGS and GIS respectively correspond to narrative generation-reception and narrative production-consumption. In GIS, various levels of narrative generation processes are driven by authors, receivers, characters, actors, and actresses. For example, a *kabuki* play is a collection of multiple narratives built around original scenarios, authentic related histories, and the actors' private scenes. The construction will be connected with the plan for a future narrative generation system comprised of several other narrative generation systems.

Fig. 2 shows an original conceptual version of GIS[2]. This idea of a conceptual model labelled GIS was originally based on the survey and analysis of Japanese folklore, performing arts including the *kabuki*, and angles of the modern entertainment business. A *geino* organization such as an entertainment agency or promoter is a synthetic narrative production-consumption system that aggregates a variety of narrative generation-reception processes of scenarios, lives of actors and actresses, etc. GIS is a comprehensive and multiple framework in which various narrative generation processes are driven by authors, receivers, characters, actors and actresses, directors, producers, etc. It is therefore one of the systems of multiple narrative structures.

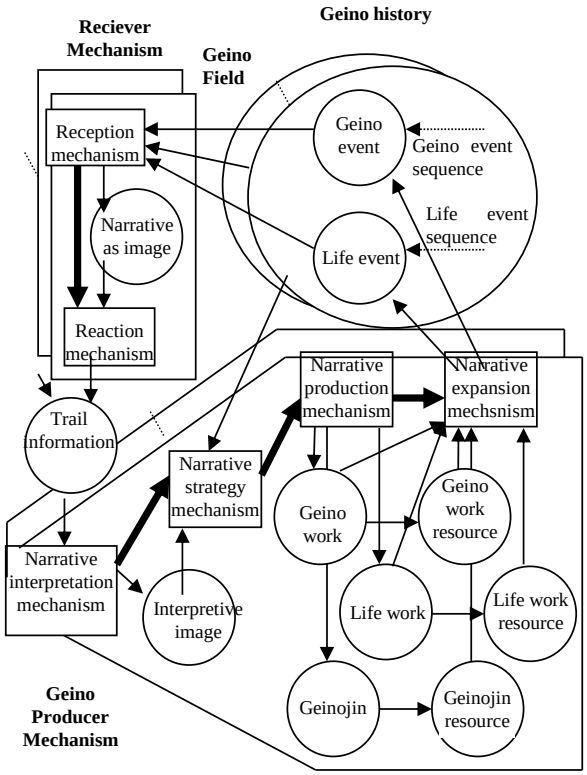

Fig. 2. The original GIS model[2]

5. Generation, Production, and Creation of Narrative

Although INGS is a tentative, but progressing system that has been developing, GIS remains conceptual design level. The design and development of GIS for bridging narrative generation-reception by INGS and the narrative production-consumption is planed dependent upon the following process through application systems' development and experiment.

For example, we have developed a multimedia narrative generation system called KOSERUBE[6]. It was designed as an application using INGS inside the system, but we do not intend to have a function through which narrative generation and reception process is repeated to store a kind of history of narrative generation, namely narrative production. By designing as such circulative production-consumption system, we will implement a prototype of GIS based on the KOSERUBE.

On the other hand, Kawamura[7] and Ogata[8] have developed advertising generation systems based on each original ideas. Advertisement as a social system is necessary to have a history or a story through the circulative generation, namely the level of narrative production-consumption. In the advertisement study as narrative in Ogata, in particular, INGS or the part as a single advertising generation mechanism will be able to be integrated into GIS.

Such an approach to GIS through narrative generation application systems design and development will be possible in a variety of systems, such as an entertainment game system[9], a new narrative approach by the model of the kabuki, and so on. Further, narrative production and consumption model in which GIS is included will link to the world of contents business including the results of narrative generation and narrative generation function itself.

On the other hand, there is an important issue in another direction. By the word of narrative "creation", we mean various values beyond only generation and production of narrative. In particular, the problem of creativity of narrative is associated to diverse values, such as entertaining value, artistic value, literary value, aesthetic value, managerial value, etc. For instance, a contents business company relating to narrative production needs to sell any values through providing any narrative contents. For the author, this problem is related to the problem of narrative multiplicity or multiple narrative structures model. We have an idea that narrative multiplicity results in narrative values. The verification of this idea or hypothesis will be attempted dependent upon the development and social practice of GIS through various application systems.

6. Conclusion

This paper presented the author's multiple narrative structures model as a background of this consideration and respectively introduced INGS and GIS as frameworks for single level narrative generation and multiple level narrative production. Next, based on the above frameworks, we discussed the possibilities of narrative-based systems and contents technologies based on the relationships among narrative generation and production, further narrative creation as the level of artistic and aesthetic problems of narrative.

In the future, INGS and GIS are necessary to organically linked as an integrated system, therefore, levels of narrative generation-reception and production-

consumption also need to be associated each other. Further, the level of narrative creation should to be considered in the relationships the above multiple system framework. Designing, developing, and experimenting (including social level) INGS, GIS, and the application system are main future works.

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