Designing an Ontology for Artificial Intelligence in the Narrative Arts

Nancy L. Green

Department of Mathematical Sciences
University of North Carolina at Greensboro
Greensboro, NC 27402 USA
nlgreen@uncg.edu

Abstract

We propose a discussion on developing a comprehensive ontology for use in AI-based narrative systems. The ontology should be applicable across art disciplines and flexible enough to accommodate possible future uses of computer media in the arts. In this paper we describe some fragments of such an ontology in more detail as a springboard for discussion. We focus on aspects related to narrative production over content. Also, the upper-levels of the ontology are intended to abstract away from media-specific features.

Introduction

A technology-enabled revolution in the narrative arts is in progress. Some AI researchers are investigating how artificial intelligences can assist with or perform tasks traditionally performed by human artists such as story writing, cinematography, and choreography. At the same time, many of those involved in the narrative arts are excited by the creative possibilities as well as the new avenues of distribution afforded by computer media. Furthermore, boundaries between art disciplines are blurring as in, for example, a dance choreographed not for stage performance but for film audience.

To date, much pioneering work in applying AI to the narrative arts has focused on building computational models whose primitives are based on theories originating from analysts in art disciplines (e.g. literary theorists) or based on handbooks intended for use by human artists (e.g. animators). Typically, the computational primitives are designed with just enough scope and detail to accommodate the needs of a specific project. By now, there may be sufficient work of this sort to begin

designing a comprehensive ontology for use in AI-based narrative systems. The ontology could characterize the goals, methods, symbol systems, participants in, and results of artistic creation. The ontology should be applicable across art disciplines and flexible enough to accommodate possible future uses of computer media in the arts. Such an ontology may not only be useful in constructing computational models but also in facilitating communication between AI researchers and artists, or between artists educated in different art disciplines.

In the rest of this paper we describe some fragments of the ontology in more detail as a springboard for discussion at this Spring Symposium. We focus on aspects related to narrative production over content. Also, the upper-levels of the ontology abstract away from media-specific features. Discussion at the symposium about the ontology might include

- Alternative ways of organizing the ontology
- Discussion of areas not listed below that should be included,
- Identification of existing sets of primitives from AI research in the narrative arts that can be used to build part of the ontology,
- Conflicts among existing sets of primitives from AI research in the narrative arts, and
- Identification of non-computationally-oriented works that provide background information on an art discipline that can be readily incorporated into the ontology.

Narrative Work

- Artistic Discipline (literature, theater, film, dance, music, photography, art, …): historic source of conventions employed in the work
  - Genre: e.g. detective novel, movie Western, television sitcom
- Theme, e.g., *love triumphs over all*

- Story World:
  - Causal-temporal chain of events
  - Story characters (see below)
  - Other: props, location, etc.
- Narration: following Lothe (2000):
  - Narrator: character that tells the story; *in* the narrative work but not *of* the story world
    - Reliability
    - Distance (dimensions: Temporal, Spatial, Attitudinal)
  - Narratee: character to which the narrator tells the story; *in* the narrative work but not *of* the story world
  - Temporal relation to story world (Retrospective, Preemptive, Contemporaneous, Embedded)
- Presentation Design
  - Modalities (1 or more concurrently): auditory (e.g. speech, noise, music), visual (e.g. image, text)
  - Mode of narrativity (Ryan 2001): simple, braided, deferred, etc.
  - Symbolism
  - Subtypes of Presentation Design:
    - Audio-Visual Presentation:
      - Camera (Angle, Distance, Motion, …)
      - Editing (Cut, Fade, …)
      - Staging/choreography
      - Paralinguistic channels (body, voice)
    - Literary Presentation:
      - Text linguistic structures
        - Text: rhetorical structure
        - Reported speech: dialogue structure
      - Text type: reported speech, action, description
      - Lexical/syntactical expression
  - Plot:
    - Perspective: dramatic character currently seeing the events
    - Relations between story units (Lothe 2000):
      - Temporal order: Chronological, Analepsis, Prolepsis
      - Duration: Descriptive Pause, Scene, Summary, Ellipsis
      - Frequency: Singulative, Repetitive, Iterative

Narrative Performance

- Narrative Work (see above)
- Historical audience (Lothe 2000): real people actually experiencing the performance (see below)

- Medium: e.g. print, stage, film, concert hall, computer screen, theme park ride, etc.
- Audience-controllable parameters, e.g., volume, pause, rewind, fast forward, closed captioning, subtitles, hyperlink navigation, VR-controls

Character (*in* the narrative)

- Biology-psychology-sociology-biography
- Mental-emotional state
- Behavioral traits, personality
- Appearance
- Vocal qualities
- Vividness
- Subtypes of Character:
  - Narrator (see above)
  - Narratee (see above)
  - Story Character
    - Function in plot: protagonist, antagonist, support-protagonist, support-antagonist

Historical audience

- Interpretation of the narrative
- Emotional state resulting from the narrative
- Evaluation of the narrative
- Character(s) in the narrative that appeal to audience
- Character(s) role-played by audience

Acknowledgments

References

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